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Rendering terms into understudied languages

Abstract

This paper deals with the translation of terms into understudied languages and partly uses data obtained through a study conducted with non-professional translators. The selected target languages are native languages in Ivory Coast, used in daily oral communication but being most of them poorly documented and some of them even endangered. While finding equivalents for terms in well-documented languages is a complex task, in understudied languages characterized by a strong oral tradition and an underdeveloped terminology the task is even more challenging. In such cases, the translator has to assume the role of a terminologist in order to be able to deliver a terminological equivalent taking into consideration various parameters. The present study deals with cases of terminological non-equivalence by investigating possible translation strategies for rendering terms and discussing the criteria according to which a proper translation strategy can be selected. In this respect, this research is placed at the intersection between terminology and translation studies.

1 Introduction

The present study deals with the translation of terms into understudied languages. The focus is on non-official languages with a strong oral tradition used in daily communication in Ivory Coast. French is the official language of the country. However, about 40 to 80 languages are also reported. Most of them are not documented and some of them already endangered. The locals use more than one native local language in their daily life, according to the particular communication context, thus constituting a very strong case of multilingualism (Ahoua 2006).

The documentation and the linguistic analysis of these languages were the focus of the DAAD research project "Côte d'Ivoire: Language in Cultural Context" conducted by Bielefeld University[1] in collaboration with the Université Felix Houphouët Boigny (2015–2018). I was assigned to one of the project actions related to the translation of specialized texts with a strong social impact into poorly documented languages, like the native Ivorian languages. Members of the DAAD project who were at that time PhD students in linguistics at the Université Félix Houphouet Boigny participated in this action. Specialized

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[1]   I would like to thank Prof. Stavros Skopeteas, one of the project leaders, who invited me to contribute to this project with an action related to specialized translation into the selected project languages.

translation was seen within the project as a means of fostering the use of these languages, especially in written communication, and reinforcing their documentation. From a social perspective, specialized translation into local Ivorian languages is expected to give more people access to information and knowledge.

My main mission within this project action was initially the design of a training course on the translation of specialized texts with emphasis on delivering proper equivalents for terms in case they exist in the target language (TL) or creating new terms in case of non-equivalence. The course took place at Bielefeld University in 2015. It involved a theoretical and a practical part to enable the participants to investigate and practice possible translation strategies. Its purpose was to train the participants of this action as (non-professional) translators.

The second part of the project action involved the creation of a small sample corpus including the translations from English[2] into five selected native Ivorian languages, namely Agni, Baule, Ebrie, Dioula and Samogokan. They belong to different language groups. Specifically, the first three belong to the Kwa languages, while Dioula and Samogokan are Mante languages. Despite the fact they are not documented, all of them are systematically used in oral communication. Baule and Dioula are two of the most widely spoken languages within the relevant group. The translations were conducted by the participants in this project action,[3] who after attending the training course were engaged as non-professional translators. The target languages were selected on the basis of their native languages.

The sample corpus includes the translation of two small, specialized texts into the five selected Ivorian languages. Both texts were selected as representative samples of two different types of text with subjects closely related to the special needs and current problems of the people in Ivory Coast. The first text is a legal text referring to children's rights (Children's rights 2015). The second refers to water pollution in Ivory Coast Calamari (1985: chapter 4). It is a scientific text mostly including terminology from the sciences of ecology and hydrology. The draft translations were examined through follow-up discussions which gave the opportunity to the non-professional translators to cross-check their translations and consult each other before delivering the final outcome.

The present study aims to discuss theoretical issues of specialized translation and terminology and to reveal the challenges of this particular type of translation especially when the target language is understudied, and the translator is not professionally trained. In this respect, this paper discusses theoretical notions that are found at the intersection between terminology and translation studies. The theoretical discussion is not only based on examples from major and well-documented languages. The analysis focuses on the

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[2] English was chosen as the source languages of the texts to be translated, since it was also the main language of communication within this rather multilingual project, the particular project action as well as the teaching language of the training course.

[3] I am grateful to Marie-Laure Adou, Adjoua Beatrice Koffi, Karidja Touré, Yao Maxime Dido and Issouf Diarrassouba for their participation in the particular project action and especially their translations into the five selected local Ivorian languages.

outcomes of the translation project action described above. Much of the analyzed data[4] is related to this project action and comes either directly from the created translation corpus or from the data discussed before and after the actual translation action, namely during the training course and the follow-up discussions.

The paper is structured as follows: Section 2 sets out a brief overview of the challenges of specialized translation especially in case where the target language is understudied. Section 3 defines the notion of term, presents the relation between language for special purposes (LSP) and general language and specifies the basic principles of term formation. Section 4 revolves around the task of rendering terms. It starts with a discussion about the notion of equivalence which is central in terminology as well as in translation studies (section 4.1). Various types of equivalence are presented in section 4.2. Section 4.3 discusses some criteria according to which a proper translation strategy can be selected in case of non-equivalence. All of the above-mentioned subjects were part of the training course on specialized translation that the non-professional translators attended before delivering the translations. Section 5 presents different types of translation strategies and section 6 draws a number of conclusions.

2   Challenges of specialized translation

Translating specialized texts is a complex task. The translator has to take into consideration different parameters in order to achieve their goal. First of all, they have to pay attention to the different levels of equivalence and especially to the word level, since a specialized text may include different types of terminology. A medical text, for instance, may include technical terminology in order to describe the characteristics of an instrument or machine but also legal terminology, if for instance insurance issues are related to this medical subject. After having identified the terms in the source text (ST), the translator has to decide on the selection of the proper correspondence into the TL concerning both the concept and the designation of the term. At this point, they also take into account various parameters, like the concept and the designation of the term in the ST, the target language and culture as well as the audience that will receive the produced translation.

Rendering terminological units in well-documented languages with developed terminology can be based on a search in a terminological database[5] or in a specialized dictionary. However, this is not possible in languages with underdeveloped terminology or in languages with, at least in some specialized domains, quite developed terminology but a lack in monolingual and/or multilingual terminological resources.

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[4]   Despite the originality of these data, it is important to point out that they are selected from a small translation sample including translations into understudied languages with a poor written tradition and no terminological resources available. Moreover, they are produced by translators who previously had no professional translation training. The particularities of the data allow only the presentation of carefully selected examples and not a systematic description of the whole sample. All errors remain mine.

[5]   E. g. the interinstitutional terminology database of the European Union (IATE 2023). For further terminological resources cf. Budin and Wright (2001: 845–858).

The characterization of a language as terminologically underdeveloped has been misleadingly used for languages that usually have many borrowed terms (Koliopoulou 2020b: 54–55). For example, the English term *software* has been translated into French as *logiciel*, while it appeared in German initially as a foreign word (*Software*), which is now integrated into the German vocabulary and also participating in the creation of compounds (e. g. *Softwarehersteller* 'software producer'). However, all three languages are terminologically developed with regard to computer science. The characterization of a language as terminologically underdeveloped is related to the fact that a number of terms are not in use, since the particular domain is not commonly used in this language. Thus, a specific type of terminology is unknown in a particular language.

While for well-documented languages rendering terms is a complex task, for understudied languages characterized by a strong oral tradition and an under-resourced and/or underdeveloped terminology, as for instance the local languages of Ivory Coast discussed in this paper, the task is even more challenging. In this case, there are usually no sources that can provide term equivalents. Therefore, the translator has to assume the role of a terminologist in order to be able to create a new term in the target language that expresses the equivalent concept with a proper designation taking into consideration various parameters.

3   Defining the notion of term

Terms consisting of form and meaning, like other words, are part of our language. The question that arises is how terms are different from words or expressions in general language. The characterization of a term is based on two criteria. On one hand, a terminological unit – a word or expression – has a domain specification, a specialized meaning in a particular domain. On the other, it may display a precise conceptual delimitation. The second criterion is like a preference rule in determining termhood. This means that most prototypical terms fulfil both criteria; however, it is also possible that a term satisfies just one of them. On the basis of these criteria, ten Hacken (2008, 2010a, 2015; cf. ten Hacken/Koliopoulou 2015) proposes a classification of terms into two types: "specialized vocabulary" and "terms in the narrow sense".

The degree of specialization determines the class of specialized vocabulary. Specialization is a gradual property based on subjective judgement. In borderline cases, judgements may differ as to the degree of specialization. In extreme cases, what is specialized for one speaker may be general for another. Thus, there is no clear borderline between general language and specialized language. Taking an example, the words *dog*, *cat* and *bird* are at the same level of specificness in general vocabulary. However, in zoological taxonomy *cat* and *dog* are species of the class of mammals, while *bird* is another kind of class. Comparing the two classes, ten Hacken (2010a: 918) argues that the zoological term *mammal* is more specialized than the term *bird*, because of the higher prominence in the distinction of the individual species of the class of mammals than the distinction between species of birds. The differentiation in the degree of specialization

correlates with the fact that *bird* is a word also used in the general vocabulary, whereas the term *mammal* is mainly used within the domain of zoology.

Conversely, terms in the narrow sense designate an absolute property. They lack a prototype structure and display precise definitions based on necessary and sufficient conditions (ten Hacken 2010a: 919–925; cf. ISO 704 2022: 5.4.5). Such a definition with sharp boundaries establishes a relationship between terms and the outside world as decoded by means of the human perception (cf. Arntz/Picht/Schmitz 2014: 42). A definition creates an artificial object or entity on the basis of the word formation rules of a particular language. A term associated with this artificial (unnatural) object or entity does not have to be part of the language knowledge of individual speakers, namely of their competence (ten Hacken 2008).

In order to illustrate the distinction between specialized vocabulary and terms in the narrow sense as well as their relation to general language, I give two representative examples from linguistics. *Head* is a specialized word in linguistics since its meaning is different compared to the homophonous word in general language indicating the upper part of a body. Depending on the linguistic theory, the term may also have a very specific meaning, which requires a definition with sharp boundaries in order to establish a connection between the term and the specialized language. On the contrary, *affixoid* is a word created to denote a specific concept and does not exist in general language. The term has been introduced to characterize borderline cases between compounding and derivation.[6] It indicates an intermediate category of morphemes which cannot be characterized as stems or as affixes. These two examples show that there is a clear delimitation between terms in the narrow sense, like *head* in linguistics, and general vocabulary, whereas the definition of specialized vocabulary, like *affixoid*, does not have sharp boundaries.

The fuzzy boundaries between general language and specialized language become obvious by taking into consideration that there are two types of language influence that complete one another (cf. Arntz/Picht/Schmitz 2014: 21–25). Imagine them as two pools connected to each other. The influence of the general language on the specialized one is designated by the notion of "terminologization". ISO 704 (2022: B.3.3) formally defines it as "the process by which a general-language word or expression is transformed into a term designating a concept in a special language". Term formation by means of terminologization is based on the adoption and semantic specialization of words from general language often through metaphor or metonymy (cf. Stolze 2013: 140–142; Arntz/ Picht/Schmitz 2014: 118–119; Bozděchová 2015: 2255). In this case, a word existing in general language becomes a term in a certain domain denoting a new concept.

A semantic transformation of an existing word may occur sometimes in more than one different domain. In this case the various naming units are considered to be different terms, despite the fact that they have the same designation and they have been formed

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6   On a discussion on the notion *affixoid* cf. ten Hacken (2000: 355–357) and Ascoop and Leuschner (2006).

through the same naming process. Taking an example, *head* is in general language the upper part of a body, while it can be also used metaphorically to indicate a significant person, for instance the head of a department. *Head* occurs through terminologization in linguistics, as already mentioned before. Moreover, it appears as a term in botany indicating the flower spike, the part or the cluster bearing the flower(s), but also in maritime terminology having the meaning of 'toilet'.

Cases of terms occurring in various domains with the same form are not rare in LSP since they foster the tendency for language economy. They represent a homonymic or polysemic lexeme[7] if their meanings are somehow related to each other. However, homonymy or polysemy in terminology is not necessarily related to the process of terminologization. To give an example, *stress test* is a term occurring in various domains. However, this lexical unit does not originate from general language. Specifically, it occurs in cardiology to indicate the testing of the heart, in social neuroscience indicating a laboratory procedure used to reliably induce stress in human research participants,[8] in computer science related to the testing of hardware or software, in engineering to designate a method to determine the stresses and strains in materials or structures and finally in finance indicating the ability of a given financial institution to deal with an economic crisis.

The unclear delimitation between general and specialized language as well as the phenomena of homonymy or polysemy among different LSP can create ambiguity in terminology. In order to standardize the process of creating new terms, ISO 704 defines the basic principles of term formation, as listed below, although it is noted that not all principles are applicable simultaneously.

(1)   Principles of term/appellation formation
   •   Transparency
   •   Consistency
   •   Appropriateness
   •   Linguistic economy
   •   Derivability and compoundability
   •   Linguistic correctness
   •   Preference for native language (ISO 704 2009: 7.4.2)

Taking these principles into consideration, different types of equivalence and strategies for rendering terms will be presented in the following section.

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[7]   On synonymy, polysemy and homonymy in naming units cf. Stolze (2013: 146–150) and Arntz, Picht and Schmitz (2014: 135–140).

[8]   The full name of this test is *Trier Social Stress Test* (TSST).

4 Rendering terms

Texts with specialized language should be treated within a translation context as non-specialized texts (Stolze 2013: 161). However, there is a particular focus on the word level, namely on how to find equivalents of terminological units and if necessary, on how to create new terms in languages that are terminologically underdeveloped and/or under-resourced. In the following three subsections, the notion of equivalence, various types of equivalence as well as criteria that influence the decision about a certain translation strategy in case of non-equivalence will be discussed.

4.1 Equivalence

Equivalence is a central notion in both Translation Studies and Terminology. However, translation equivalence does not necessarily correspond to terminological equivalence. Terminological equivalence is often attributed to the concept level. This means that terms are not just "translated" and that equivalents are selected after concept analysis. Equivalence can also be established at the form level referring to the designation, while the combination of both levels is also possible (León-Araúz 2022: 480–481). Compared to that, equivalence in translation focuses mainly on the text. Translators aim for a context-sensitive equivalence, in contrast to a terminologist's task, which is often a context-free equivalence.[9] In this respect, equivalence in translation is a broader notion than it is in terminology. Moreover, decisions about equivalence in translation can also be affected by parameters and criteria (section 4.3) that do not apply to terminological equivalence and may even go beyond the text level. The strategies used in term formation partly overlap with the strategies used in translation, although more strategies including hypernym, paraphrase or even omission are possible in the second case (León-Araúz 2022: 479).

This paper focuses on terms and especially on how terms can be rendered into understudied languages. The research is conducted within the context of translation of specialized texts. Term equivalents were selected, and even new terms were formed not to create a domain-specific terminological resource, but to fulfill the translation purpose of the particular project action and to serve the general purpose of the project related to the documentation and linguistic analysis of understudied languages. In this respect, this research is placed at the intersection between terminology and translation studies. The notion of equivalence goes beyond the concept and designation level and reaches the textual level. Taking this into consideration, the term formation strategies discussed below are put in the broader frame of translation studies giving the translators/terminologists more mechanisms to deal with non-equivalence. This is dictated by the purpose of the research project, but it is also inevitable since the translators/terminologists are dealing with understudied and terminologically highly under-resourced TL.

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[9] Despite these general tendencies, the exact type of equivalence depends on the nature and the purpose of the actual task.

Various types of equivalence as well as translation strategies will be exemplified below mainly by means of terminological suggestions in the selected local languages of Ivory Coast. These suggestions were made by the non-professional translators participating in the project and translating the two source texts after attending the training course on specialized translation.

4.2 Types of equivalence

Identifying a type of terminological equivalence is a matter of contrastive analysis of two terms in different languages. After having determined the domain, the semantic content of the two terms is to be compared. The comparison can be carried out on the basis of the two definitions formed with necessary and sufficient conditions. Needless to say, in case there are two terms in different languages to be compared, the translator is dealing with a type of existing equivalence. In case the TL does not display a terminological equivalence, the translator/terminologist must be able to render the term by selecting the proper strategy in the given translation context.

Different classifications have been proposed regarding the various types of equivalence both in terminology and translation studies[10] (cf. Baker 2011: 18–23; Arntz/Picht/Schmitz 2014: 144–148; Koller/Henjum 2020: 265–278; León-Araúz 2022: 481–485). Taking into consideration the purpose of this study, I systematize the various subtypes into the following basic types:

(2)   Types of equivalence
      1   Total equivalence
      2   Partial equivalence
           a   One-to-many equivalence
           b   Many-to-many equivalence
           c   Inclusion
      3   Zero equivalence

The first type of equivalence (2.1) displays a full semantic correspondence between two terms in different languages, a one-to-one equivalence. This type is usually possible among terminologically equally developed domains in the SL and TL. In most cases these perfect matches are standardized terms also displaying equivalence at form level. The terms *European Council*, *Council of Europe* and *Council of the European Union* are examples of total equivalence between, for instance, English, French and German, as shown in (3).

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[10]   There is often overlapping within the types of terminological equivalence discussed within translation studies.

(3)   a   European Council
              Conseil européen   (fr)
              Europäischer Rat   (de)
        b   Council of Europe
              Conseil de l'Europe   (fr)
              Europarat   (de)
        c   Council of the European Union
              Conseil de l'Union européenne   (fr)
              Rat der Europäischen Union   (de)

The translations provided for the term *children's rights* in the five local languages under study indicate a full correspondence to the SL term und thus belong to the first type of equivalence, as presented in (4).

(4)   children's rights
        a   mmàtᵊr̀ą̀ mmàlà   (*Agni*)
              lit. children rights
        b   bamũ me mmlamũ   (*Baule*)
              lit. children POSS[11] rights
        c   deŋ hakɛjalu   (*Samogokan*)
              lit. children rights
        d   dɛu hakɛjau   (*Dioula*)
              lit. children rights
        e   ḿmjɔ́ bìdí   (*Ebrie*)
              lit. children rights

The examples given in (4c) and (4d) display a clear form equivalence explained by the fact that the two languages, Samogokan and Dioula, belong to the Mante language subfamily.

The types of equivalence in (2.2a) and (2.2b) are both cases of partial equivalence. They indicate a different semantic and conceptual delimitation between the two compared terms. In both cases, a semantic and pragmatic interpretation of the SL term is necessary in order to select the most proper equivalent in the TL. To give an example for the one-to-many equivalence (2.2a), *runway* in aviation terminology corresponds to two subordinate terms in the equivalent LSP in German, namely to *Startbahn* for taking off and to *Landebahn* for landing. In this case the term *runway* includes the semantic content of both German terms. German displays a distinction in the meaning of *runway* but lacks a hypernym. Moreover, English has a superordinate term but lacks the subordinate concepts. Thus, in both languages there is a lexical gap.

The semantic and conceptual delimitation of the compared terms in different languages in many-to-many equivalence (2.2b) is not as clear as in one-to-many equivalence (2.2a). An example for (2.2b) is the distinction of meaning between *soil*, *land*

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11   POSS stands for possessive.

and *country* which correspond in French to two notions, *terre* and *pays*. Specifically, *terre* can be selected to render either *soil* or *land*, while *pays* corresponds to the concepts *land* or *country*.

Comparing the two types of equivalence with different delimitations, in the case of *runway* for (2.2a) there is an equal split of the meaning into two subordinate terms in German, but the conceptual external limits overlap. Moreover, the delimitation between the concepts *Startbahn* and *Landebahn* are clear, so that a translator rendering the term *runway* into German can easily select one of the two equivalents. However, in (2.2b) the conceptual boundaries either between *terre* and *pays* in French or among *soil*, *land* and *country* in English are fuzzy. Due to this unclear delimitation, it is particularly difficult to select the proper concept in one of two languages and even more to translate it into the TL. The two types of delimitation are presented schematically in figures (1) and (2)[12] respectively.

Startbahn	runway
Landebahn	
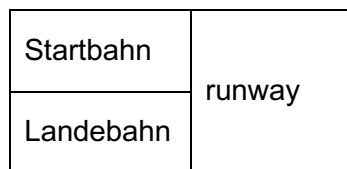
Fig. 1*: Delimitation with sharp conceptual boundaries*

terre	soil
	land
pays	country
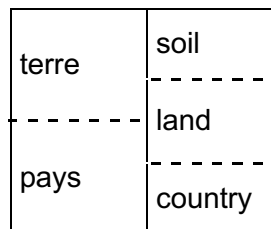
Fig. 2: Delimitation with fuzzy conceptual boundaries

To give some examples from the local languages under study, consider the translation of the term *human rights* into Agni, as given in (5a).

(5)   human rights
       a   kùlò sᵒ̂rɔ̀wɑ̀ mmàlà   (*Agni*)
             lit. village person rights

In this case, the delimitation of the concept *human rights*, translated as *village person rights*, has a clear pragmatic background influenced by the cultural characteristics of the language, since *human* is translated as *village person*. In Agni, there is a clear emphasis on the members of small communities. The translation of the term *human rights* in other languages, like French and German, shows that the concept *human* has in each of them a different delimitation.

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12   The schematic representations are based on Trier's theory (1973) on semantic fields.

(5)   b   droits de l'homme   (fr)
            lit. rights of the people/man
       c   Menschenrechte   (de)
            lit. people rights

Specifically, *human* is translated into French with the noun *homme* which is ambiguous indicating either 'people' ('human') or the concept of 'adult male', while in German the concept *Mensch* ('human being') is used.

Similarly, the translations of the term *civil rights* in three different local languages of Ivory Coast indicate different delimitations of the concept *civil*, as presented in (6).

(6)   civil rights
       a   tᵊ̀rà̰bᵉ̀lὲ nú mmàlà   (*Agni*)
            lit. human life rights
       b   aɲisye mmlamũ   (*Baule*)
            lit. people-alive rights
       c   ágòthó bìdí   (*Ebrie*)
            lit. society rights

Specifically, in (6a) and (6b) the concept *civil* contains the meaning of life given as 'human life' in Agni or as 'people alive' in Baule. In Ebrie (6c) the same concept has been translated by the notion of society.

Inclusion (2.2c) is the third type of partial equivalence discussed in this paper. In this case, one concept only covers part of the other concept, since the second contains more features (Arntz/Picht/Schmitz 2014: 146–148; León-Araúz 2022: 482). An example of this kind of partial equivalence is found in the suggested translations of the term *crustaceans* in Ebrie and Baule, as given in (7).

(7)   crustaceans
       a   kóntró   (*Ebrie*)
            lit. crab
       b   joko nzeklɛnzɛ   (*Baule*)
            lit. crab shrimp

In both languages the term has been rendered by the name of a well-known kind of crustacean, such as the crab, selected for the translation in Ebrie (7a). The translation in Baule (7b) consists of two kinds of crustaceans forming a coordinative compound. In both cases, one kind or two of the whole crustacean group of animals is used to render the SL term. The suggested terms in the two TL only cover part of the concept of the term in the SL, and thus the concept of the TL terms is included in the concept of the SL term.

The last type of equivalence (2.3.) indicates the complete lack of equivalence in the TL. This type of equivalence mainly results from cultural differences among languages. Due to this fact it is possible that a concept is completely unknown in another language. Baker (2011: 18) mentions the example of the *airing cupboard*, a small room or closet

which is designed to house the core elements of a heating system, such as a boiler or a hot water heater. This particularly warm room has been used by housewives for drying or storing various things. This concept is common in a British context but totally unknown in other cultures.

Zero equivalence or non-equivalence may have different manifestations. A concept may be semantically complex, so that it is rarely lexicalized in another language. An example is the Brazilian word *arruação* meaning 'clearing the ground under coffee trees of rubbish and piling it in the middle of the row in order to aid in the recovery of beans dropped during harvesting' (Baker 2011: 19). In countries where the cultivation of coffee or cacao trees is not a common activity, this concept is certainly unknown. However, apart from the cultural diversity among countries, the semantic complexity of this concept may prevent its lexicalization and moreover its standardization, even in languages where the concept is not unknown.

In other cases, a concept may be lexicalized with a slightly different delimitation among languages because of the conceptual complexity that it displays. The concept for clearing the ground for coffee plantation is familiar in the local languages of Ivory Coast due to the high level of production of coffee and cacao in this country. However, there is no one-to-one equivalence between *arruação* in Brazilian and the comparable terms in Samogokan and Dioula given below.

(8) a sɛnɛ-rɔ-burugu   (*Samogokan*)
        lit. farm-in-cleaning
     b foro-kɔnɔ-bi̱-ʃa̱   (*Dioula*)
        lit. farm-in-bush-clean

Moreover, the comparison between (8a) and (8b) shows a slight semantic difference in the lexicalization of the same concept in two related languages, like Samogokan and Dioula. Specifically, the term in Dioula contains the notion of *bush* which is missing in the equivalent term in Samogokan.

Another parameter that may influence the standardization of known concepts in a language is the selection of a translation strategy in order to render the terminology of a domain in a given language. In particular domains, a concept may be known and still not translated into the TL. In case a known concept lacks a lexicalized equivalence in the TL, a term may be used in its SL form evading the last principle of term formation (1) considering 'preference for native language'. Take for instance terms from computer science used in various languages in their original English form, like *internet*,[13] which is also used in Samogokan and Dioula. In this case, the borrowed term has been adapted to the morpho-phonological characteristics of the language, as presented below.

(9) internet
        ɛ̱tɛrinɛti   (*Samogokan/Dioula*)

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13   Cf. *software* discussed in section 2.2.

The so-called "false friends" can be, according to Arntz, Picht and Schmitz (2014: 148), another type of zero equivalence. In this case, similarity in form does not coincide with semantic equivalence. A well-known example between French and English is the noun *procès*, which does not indicate a process in French, but a trial. Each one of these different concepts corresponds to another lexical item in the TL. Specifically, the English word *process* corresponds to *processus* in French, and the French word *procès* means *trial* in English, as already mentioned. This demonstrates that false friends do indeed have equivalents and therefore I consider that false friends should not be regarded as a type of zero equivalence.

4.3   Selection criteria

The selection of the appropriate translation strategy in case of zero equivalence is a multifaceted decision that a translator (or a terminologist) has to take weighting various criteria. Among the principles of term formation given under (1), transparency is crucial. Terminologization is one of the most common strategies to create a new term. Several domains can profit from this strategy, so that a general language word may end up being used in different LSPs to designate different concepts. This practice can create cases of homonymy or polysemy among different LSPs, sometimes even displaying a high degree of ambiguity, which ideally should not be transferred into the TL text. Therefore, the selection of a proper term equivalent is significant for the clarity of the translation product. Moreover, in cases where a paraphrase is used or a neologism is formed, it is generally recommended to give the original (SL) term in parenthesis. Sometimes, the combination of two strategies is recommended in order to achieve a better understanding.

The type of specialized text, namely legal,[14] scientific or technical influences the selection of a translation strategy. The terminological characteristics of each domain should be taken into consideration, so that the new terminological proposal corresponds to the term family of the particular domain. To give an example, legal terminology displays two different types of constraint: legal terms are influenced by the language characteristics as well as by the existing legal system in force in each country (cf. ten Hacken 2010b: 408; Arntz/Picht/Schmitz 2014: 162–170). French legal terminology is, for instance, different in France, Switzerland, Belgium, Canada, Ivory Coast and in Vanuatu. Therefore, it is rather common in legal texts to give the legal term of the SL as well as the official translation or a paraphrase, especially in case where an official translation does not exist in the TL. The reason for providing the term in the SL is to help the readers identify the term and give them the opportunity to find information on this term in the SL (Byrne 2006: 28).

The specific characteristics of the domain or the text type as well as the terminological tradition of the TL are significant parameters for the selection of the proper strategy. The choice of the best solution in case of zero equivalence is a matter of language culture. Borrowings are, for instance, dispreferred in French terminology,

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14   For a discussion on the grammar and structure of British legal texts cf. Hiltunen (2012).

although neoclassical formations (e. g. *microcéphalie*) or generally elements with Latin origin are part of the native French vocabulary (cf. Darmesteter 1894; ten Hacken 1994: 131–132; Lasserre 2013). In the case of non-Latin or non-neoclassical formations in French terminology, the translator should consider one of the other available strategies or a combination of them. By contrast, languages like Greek or Croatian are likely to accept foreign elements in their vocabulary.

The coexistence of two translation strategies may be a legitimate practice in particular cases (cf. Sager 1997: 40–41). To give an example, chess terminology in Greek displays many doublets (ten Hacken/Koliopoulou 2015: 69–73). The standard terminology in Greek mainly consists of loan words and neologisms. However, the terminology in use mainly consists of phonetically adopted borrowings from French, English or more rarely German, resulting in a parallel term register. This kind of terminological diglossia[15] is certainly not a widespread phenomenon. It is rather restricted to a particular domain in a specific language, for instance the German medical language displays many doublets consisting of a neoclassical formation and the translation in German, like *Gastroskopie* and *Magenspiegelung* ('gastroscopy').

Further criteria influencing the selection of an appropriate translation strategy are related to the purpose of the translation as well as to the characteristics of the target audience. According to the expedience and the practicality of the text subject, the translator may decide either on a more SL-oriented strategy, such as the maintenance of the source term accompanied by a paraphrase, or on a strategy focusing on the TL, for instance the creation of a new term. The translator may receive instructions with regard to the preferred strategy in the case of zero equivalence. The identity of the final recipient, i. e. the characteristics of the target readers, may also influence the translator's decisions. Characteristics including, for example, status, age, education and possible prior knowledge of the subject, should be taken into consideration, since the readers of the TL are the main consumers of a translation product.

Translating specialized texts into understudied and under-resourced languages like the selected five local Ivorian languages is a highly challenging task. Specialized translation can and should be used in these languages not just to support the local communities, but also to foster the documentation of the languages. However, because of the lack of standardization in these languages, people practicing translation should be aware of the selection criteria discussed above, in order to avoid, for example, cases of terminological diglossia that would create opacity on a terminological level and uncertainty as far as the information is concerned on a social level.

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[15] A similar example of terminological diglossia is found for instance in maritime terminology in Croatian, where there is also a differentiation between the standardized terminology and the terminology in use (Pritchard 2006: 276).

5   Translation strategies in this study

In rendering terms there is often an overlap between terminology and translation studies, since this task is not taken over primarily by terminologists but is often part of a translator's job, even if they are dealing with extensively studied and terminologically developed languages (cf. Floros/Grammenidis 2012: 86–89 for Greek). In case of zero equivalence, the translator assuming the role of a terminologist may consider selecting one of the different strategies available for rendering a term (cf. Sager 1997: 25–41; Pritchard 2006: 269–270; Atibakwa-Baboya 2008a: 55; Baker 2011: 23–44; Munday 2012: 86–89; Arntz/Picht/Schmitz 2014: 117–125; Bozděchová 2015: 2255–2258). In the following, I discuss some of the basic strategies,[16] which were also found in the project data.

(10)   Paraphrase

(11)   Creation of a new term
    a   Borrowing
    b   Terminologization
    c   Creation of a complex lexical unit

The combination of two of the above strategies in order to provide the reader with more information was also found in the project data. In the following, I present each type of strategy in some detail.

To paraphrase a term means to describe the meaning of the concept in the TL with a literal or free translation. In this case, the translator/terminologist may also provide the SL term. The original term or its paraphrase in the TL usually comes in parenthesis. Paraphrasing is an uneconomic but transparent strategy. It presupposes the translator's deep comprehension of the term, while it offers the target reader a high degree of meaning precision. However, a paraphrase as translation equivalent does not have a lexical status as opposed to the source term. This strategy is commonly used in rendering concepts from terminologically developed languages into less developed ones. To give some examples from the local languages under study, I present the following suggested translations of a legal term and a term from the science of hydrology.

With regard to the legal term *international human rights law*, the lack of a standard-ized translation for the concept *international* leads to various paraphrases, as presented in (12).

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[16]   These basic strategies with examples from the translation of the Universal Declaration of Human Rights into a central African language are discussed in Diki-Kidiri (2008).

(12)   international human rights law
     a   srãble mmlamũ nga mɛ̃ mwã sjesje-li   (*Baule*)
          lit. human rights that world all arrange-past
          human rights arranged for the whole world
     b   jamanạu-ni-ɲɔgɔɔcɛ-adamadẹnạ hakɛja ʃarija   (*Dioula*)
          lit. countries-and-between-humanity right law
          human rights law for all countries
     c   ɟamanạ-ni-ɲɔgɔ-cɛ adamadẹnạ hakɛja ʃarijalu   (Samogokan)
          lit. countries-and-other-between humanity right laws
          human rights law for all countries

Specifically, the translation of *international* into Baule is paraphrased on the base of the word *world* and the indefinite pronoun *all* denoting that this particular type of law is applicable to the 'whole world'. The translation into Dioula and Samogokan has a similar denotation. It consists of the nouns *countries* and *humanity* connected to each other by a kind of reciprocal pronoun in order to express that all countries of the world apply the same law.

    Similarly, in case of *benthic population* (13), the translators have chosen to paraphrase the term with a free translation in order to offer a better understanding of the concept. Specifically, the term has been described as 'things living in the (bottom of the) water'.

(13)   benthic population
     a   nzye bo nigemũ   (*Baule*)
          lit. water below things
     b   ɟi dumạ jɔrɔ kɔnɔ nimafɛu   (*Dioula*)
          lit. water bottom area in-living-things
     c   ɟi dụmạ jɔrɔ rɔ nimạfɛlu   (*Samogokan*)
          lit. water bottom area in-living-things

In translation practice, the translator works on a two-language base. The SL may display a lexicalized concept which lacks a name in the TL. In this case the translator has two basic options; to paraphrase the concept (10), as already exemplified above in (12) and (13), or to create a new naming unit in the TL (11). The translator's decision to fill a conceptual gap in the TL with a new term, i. e. a lexicalized naming unit, is an onomasiologically motivated strategy, as opposed to paraphrase. Such an onomasiological motivation originates from the speaker's need to find an appropriate name for an existing concept in his own language, as ten Hacken (2012: 284–285) argues. In this case, they have a choice among various, possible secondary term formation strategies (Sager 1997). Secondary term formation strategies apply in monolingual or multilingual contexts. In a monolingual context, there is already a designation for a concept in a certain language, which is revised and maybe changed in the same language. When the task is to give the concept a name in another language, then there is a secondary term formation process taking place in a multilingual context, as in specialized translation. However,

creating a new term does not necessarily mean to create a lexical unit ex nihilo, i. e. a neologism or a neonym as it is called by Rondeau (1981; cf. Cabré et al. 2012; Humbley 2018). The translator may adopt an SL-oriented strategy maintaining the original term (11a). Otherwise, they may select a TL-oriented strategy by introducing a new naming unit using TL word formation mechanisms (11b, 11c).

If the source term is widely known in its original form, it is possible to transfer the term into the TL as it is, i. e. as a borrowing (cf. Sager 2001; Cabré et al. 2012; Faber/ Navajas 2017; Humbley 2018; Koliopoulou 2020a, b). This type of strategy is common not only in specialized language but also in general language. Borrowings may originate from various languages. In many cases, the original concept is culture-specific in the SL. Common words like *banana*, *juke* and *jazz* come from West African languages. Borrowed words are often adapted to the TL's phonology and morphology. As an example for a borrowed term, consider the translation of the term *civil rights* in Dioula and in Samogokan, given in (14). The first part of the term is borrowed into these two languages and originates from the French term *civil*.

(14) civil rights
       a   siwili hakɛja   (*Dioula*)
            lit. civil right
       b   siwili hakɛjalu   (*Samogokan*)
            lit. civil rights

Borrowing is also a common strategy with regard to widely used, recognized abbreviations, for instance to those related to biology and medicine[17] like *DNA* and *AIDS*. In this case the abbreviation is borrowed and "localized"[18] into the TL taking into consideration the specific language characteristics (cf. Stolze 2013: 140). The adaptation, for instance, of English abbreviations into French is usually related to the different head position in the two languages, as illustrated in (15) and (16).

(15) DNA
       ADN   (fr)

(16) AIDS
       SIDA   (fr)

These two well-known abbreviations have been transferred into the local African languages, through French, as presented in (17) and (18).

(17) ADN
       a-de-ɛni   (*Dioula/Samogokan*)

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[17] For a discussion on the translation of medical terms into native languages of Ivory Coast, including Baule also discussed in the present paper, cf. Nahounou (2024).

[18] According to Ditaranto, "localisation means adapting all aspects of a product to the specific needs and cultural preferences of a target market, including content and design as well as language" (Ditaranto 2005). Further cf. Sandrini (2008), Stolze (2013: 259) and Schmitz (2015: 451–452).

(18) SIDA
sida-bana̱   (*Dioula/Samogokan*)
lit. SIDA-disease

Specifically, the French abbreviation *ADN* is used in Dioula and Samogokan as a phonetical transcription, while *SIDA* has been lexicalized, combined with the word *bana̱* ('disease').

Another possible secondary term formation strategy is that of terminologization through metaphor or metonymy[19], as already mentioned in section 3 with the example of the word *head* which has been adopted by several domains. In the case of terminologization, the selection of the lexical unit is crucial in making the suggested terminological equivalent unambiguous and, where possible, transparent. This new term has to be adjusted to the specific characteristics of the TL as well as to the already existing terms of the particular domain.

This strategy was found in the translations into the African languages under study. For instance, the term *crustaceans* (7) has been rendered into Ebrie and Baule through the use of the name of a well-known kind of crustacean, like 'crab' in case of Ebrie (7a). In Baule, the translation of the term is based on the metonymical terminologization of two common kinds of crustaceans, namely the 'crab' and the 'shrimp' (7b). In both cases, the concept *crustaceans* is rendered by using the name of one or two of the most representative species of the crustacean group of animals. Taking into consideration that Baule and Ebrie belong to the Kwa languages,[20] it is interesting to note that the same strategy, namely terminologization, is used for rendering the SL term.

Apart from terminologization, there are various other naming processes based on which a translator may create a complex lexical unit. Common naming processes are derivation, compounding or the formation of multi-word terms which can be transformed into abbreviations in order to restrict their length. The preference for a particular process is related to its productivity and its specific characteristics in a particular language (cf. Sager 1997: 30–38). A typical example is the formation of new terms through the process of compounding, namely the combination of two (or more) morphological items in order to form a new complex word. How productive the process is in a particular language influences the weight of this particular word formation process in term formation.[21] Productivity may also refer to a specific type of compound, for instance to noun-noun compounds, influencing the formation of terms. However, this correlation does not presuppose that all productive characteristics of the word formation process are activated

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19   Examples of metaphorically and metonymically created new terms (although the distinction is not consistently made) in central and western African languages are discussed in Diki-Kidiri, Mbodj and Atibakwa-Baboya (2008).

20   Within the Kwa languages, they belong to different subgroups: Potou for Ebrie and Northern Bia for Baule and Agni, which is not discussed here in this example.

21   Cf. Arntz, Picht and Schmitz (2014: 120–121) for German, English and the Romance languages and Koliopoulou (2017) for the translation of German compounds into English. On the role of word formation in the creation of new terms in central African languages cf. Atibakwa-Baboya (2008b).

in the formation of terms. Taking suffixation as an example, there have been studies with regard to the degree of frequency of suffixes in various domains within the same language.

There are several examples in the corpus indicating that the creation of a complex lexical unit is a relatively common strategy in the languages under study, as for instance, the translation of the term *criminal* into Agni, Baule and Ebrie (19).

(19)   criminal law
        a   àbɔ̀zàmɔ̀ nìgé   mmàlà   (*Agni*)
             lit. wrong things rights
             law against wrong things
        b   satɛmũ mmla   (*Baule*)
             lit. bad-things right
             law against bad things
        c   ákhúthékágɔ̀ bìdí   (*Ebrie*)
             lit. prison right
             law usually affecting a prison sentence

The equivalent of *criminal* into Agni and Baule is a general description of the concept (wrong or bad things), whereas the equivalent in Ebrie is focusing on a type of sentence after a criminal act, typically a prison sentence.

Similarly, *phytoplankton* (20) has been translated as 'grass in the water' creating in Agni, Dioula and Samogokan new complex lexical units.

(20)   phytoplankton
        a   nzùé-sɔ̀ ndìlè   (*Agni*)
             lit. waterPOST[22] grass
        b   ɲi kɔ̠nɔ̠ bi̠   (*Dioula*)
             lit. water in grass
        c   ɲi rɔ bi̠lu   (*Samogokan*)
              lit. water in grasses

The combination of more than one naming process is also possible in the formation of new terms, as argued by Bozděchová (2015: 2255–2258). The translation of the term *crustaceans* into *joko nzeklɛnzɛ* ('crab shrimp') into Baule (7b) indicates the combination of terminologization with a word formation mechanism, i. e. compounding, since the naming unit 'crab shrimp' is a coordinative compound. Another example is that of the translation of the term *civil right* into Dioula and Samogokan (14), where the new TL term has the form of a compound, while its first part is a borrowing ('siwili').

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22   POST stands for postpositional.

6 Conclusions

The translation of specialized texts is a multifaceted process which presupposes knowledge of various fields, not only because of the different types of terminology that usually occur in a specialized text, but mainly because of the different parameters that a translator has to take into consideration in order to deliver a proper translation. However, the emphasis is certainly on the word level, namely on the actual process of rendering terms. The first requirement is to know what a term is, in order to be able to recognize its conceptual content in a text. The correct identification of terms in a ST enables translators to define the type of equivalence they are dealing with and thus to render them properly, even if there is no standardized equivalent in the TL, as in the five selected Ivorian TL. In this case, the translator has at his disposal a number of strategies that may be used in order to translate a term. The selection of the proper strategy is a complicated decision, in which various criteria have to be taken into consideration. Translating texts with LSP into a language with a strong oral tradition increases the possibility that the type of equivalence the translator is dealing with is that of zero equivalence. In this case, the translator assumes the role of a terminologist. This raises the question of what the most pertinent strategy to render terminological units into such languages is.

The translation of the two sample texts, a scientific and a legal one, into the five local languages under study shows a clear preference in the selection of TL-oriented strategies. Conversely, borrowings were generally dispreferred since they presuppose knowledge of the SL term. This kind of strategy was rare in the sample of texts. In the few cases found, the English term was transferred into the TL through its French equivalent, since French is the official language in Ivory Coast. This process was followed in order to increase the possibility that the borrowed term would be understandable for the final reader.

The TL-oriented strategies found in the sample corpus include either translations with no lexical status, namely paraphrases, or the creation of new terminological units. Despite the uneconomical way to translate terms by paraphrasing them, this strategy is relatively common in the selected corpus, since it provides a high degree of transparency, which in turn supports comprehension of the term. The creation of new terms, either through terminologization or through the formation of a complex lexical unit, is another common strategy found in the corpus showing that the translators have provided onomasiologically motivated translations, despite the fact that the selected TL have a strong oral tradition. This reveals the translator's effort to reinforce the use of the TL by deciding for the selection of TL lexical resources.

The translation of specialized texts, especially into languages with a strong oral tradition such as the five selected local languages of Ivory Coast discussed in this paper, is of great importance. It strengthens the bonds in a local community and provides the people with access to knowledge or generally information and even solutions for current

issues. Moreover, terminological development affects language policy decisions.[23] It can promote language planning efforts in Ivory Coast (cf. Djité 2000) by supporting the documentation and even the expansion of the native local languages. Specialized translation into understudied languages, especially African languages that are often spoken by large populations, can also foster decolonization and become a means of democratization.

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[23] For a discussion on language policy and terminology cf. Budin and Wright (1997: 250–251) and Antia (2015).

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