Addressing Incorrect Machine Translation in Lexicographic Repositories to Avert Further Damages to the Igbo Language

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ABSTRACT

Lack of indigenous specialised terms in some machine translated works seems not to reflect the indigenous knowledge of some African Languages . This pose challenges for translators, agricultural extension officers and second language learners. This study analyses existing lexical information of Igbo agricultural terms in some machine translation works with the intent to establish its conformity with the Igbo indigenous knowledge of such terms. Sixty three lexical items in English were drawn from google translate and Watchtower library as our sources of primary data collection. Literature texts served as the secondary sources of information. Jean Herbert's Interpretative Theory of Translation was adopted as a framework for the analysis of data. Findings revealed that using Watchtower Library and google translate as lexicographic materials to aid the translation of Igbo agricultural terms had some demerits irrespective of its conformity to Igbo structural forms. This implies that existing machine translation works lack the capacity to translate Igbo indigenous agricultural knowledge. This study concludes that there is a need to provide a new specialised machine translation software which further serves as a lexicographic repository. Therefore, providing a sentence level interlinear offline android based translation application for Igbo agricultural terms facilitates translation for Igbo native speakers, learners,teachers,translators and any other users . It is recommended that similar studies be carried out for commerce, government, religion, science and technology among others as a means to preserving specialised Igbo registers for specific purposes.

KEY WORDS. Igbo Lexicography,indigenous knowledge machine translation, sentence level interlinear, off-line android application
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I.   INTRODUCTION

Lexicographic repositories in this study are reference tools or materials systematically prepared to reflect the knowledge of a language. Such resources be they on-line or off-line usually assist learners and translators clarify their intentions. Previously , reference tools were limited to traditional book-like products such as word lists, dictionaries, encyclopaedia and thesaurus which were not usually easily accessible at points of need. In a fast changing world as ours today, emerging innovations on setting increase for generational flow of cultural/indigenous knowledge interaction , readily available representation of cultural information competes with these traditional tools.

Scholarly consensus opine that Machine Translation (henceforth MT) , a sub-field of computational Linguistics concerns itself with the translation of texts or speech from one natural language to another (Malik, Gupta & Baghel, 2013). With or without human existence ,it aims at translating automated information transferred from a source language to a target language using a computer software (Banna & Naeem, 2016; Zong, 2018). Giving a historical account, Zhony and Zany (2020) conceptualised Machine Translation as an old practice postulated by Warren Weaver in 1945 to automatically translate human language. Such process Vieira, Minako, and O'Sullivan (2021) claim models between any pair of language; as a result, multilingual communication which is increasingly a global norm becomes facilitated. In other words, Machine Translation avail humans the opportunity to communicate and to understand different texts in various languages.

In the field of agriculture, for instance, some extension officers are challenged with appropriate equivalent words or phrases for disseminating in the indigenous languages, recent findings or innovations to achieve maximum cooperation from rural farmers. Nwankwo (2019) argues that it is not always the case that some innovations are totally new to some cultures but that the equivalent words or phrases used

previously within that culture were sometimes not readily available to younger generations. Such gap she claims may have occurred due to inability of generations past to document the indigenous terms in lexical data banks or appropriate lexicographic   repositories.

In the Igbo language which is the target language in this study,   the wealth of information on cultural lexemes for traditional agriculture, values, history and life of the people seems not to be adequately preserved in lexicographic repositories to be   bequeathed   to younger generations . As a result little or no systematically arranged specialised information on agriculture is available on recent technological lexicographic tools.

Although some on-line lexicographic resources such as Jehova's witness corpus and google translate aid learners and some scholars to do interlinear sentence Igbo translation , there seems to be irregularities with the sentences structures and this distorts indigenous knowledge and meanings. while Jehova's witness corpus is an off-line specialised library for study but has translation features with Igbo corpus. provides wrong information on specified   lexemes. For example, Google Translate which is a general purpose on-line translation application   translates Earthworm as Ọbara (blood), African salad as Afrịka gbawara instead of Edị ụra, African mango as mango nke Afrịka instead of ọgbọnọ or agba which are inaccurate and unacceptable by the native speakers of the language. Jehovah's witness presents the word 'barn' as *ihe ubi* (crops) instead of *Obaji* to mention but a few. These shortcomings limit the acceptability of such apps as lexicographic tools for translation works. Since agricultural development is a regular activity between professionals and indigenous farmers, the choice of providing a side by side inter language content of agricultural terms for Igbo from the perspective of an indigenous linguist avails Igbo native speakers, translators and second language learners the opportunity to acquaint and update themselves with appropriate Igbo agricultural knowledge.

From the above views of different authors, existing lexicographic tools observed in MT, as a branch of Computational Linguistics lacks the capacity to restore the meaning of original text in the translated version if the language must be placed on similar global pedestal with English , German and French. This , the present study aims to attempt. To achieve this linguistic pedestal with other foreign languages ,.this study aims to access existing indigenous agricultural terms in an emerging global world using English as a source language. This the study will achieve through a linguistic analysis of the selected agricultural terms to ascertain the potentials the Igbo language has in order to enhance lexicographic information of specialised Igbo language repository for global use .

Research questions
In what ways does the linguistic features of agricultural terms analysed enhance the lexicographic information of specialised Igbo language repository?
In what ways will an off-line specialised mobile dictionary of agriculture in Igbo, French and German languages empower Igbo language globally ?

Significance of the study
This study is very significant to the sustenance, vitality and continuous existence of the indigenous agricultural knowledge of the Igbo in some ways.
First, this study encourages continuous use of the electronic version of the language as it serves the purpose of language documentation and translation. The android platform downloadable on-line also gives it an an archival value for the documentation of the Igbo language.
The study   provides a multilingual translation system for Igbo and international languages for learners, translators and diasporas working on agricultural specialised terms of the selected languages.
Second, educational resources on specialised vocabulary needed for the Igbo language teaching and learning in agriculture would have been achieved. A work of this nature in language teaching serves as a stepping stone for providing similar studies in the fields as sport, education, administration, commerce, technology, among others, all of which can be used for teaching vocabulary development in the Igbo language.
 Linguists, language researchers, teachers, government agencies and other policy makers will find the work useful in making policies that boost reviving endangered languages through term preservation approaches.
 This study is divided into five sections. Section one introduced the statement of the problem, objectives, research questions, scope, and other important things. Section two reviewed related literature on the concepts of terms as used in this study, theoretical framework and empirical studies. Section   three discusses the methodology employed for data gathering, data type and sampling method. In section four, the data derived from available software tools provided the analysed pattern of linguistic features of the selected terms . The findings, discussions, summary of findings, conclusions and recommendations were presented in section five.

Igbo Language and Machine translation
According to Ayogu, Adetunmbi and Ojokoh (2018), there is a need and urgency to increase the scale of research for the development of translation tools and devices especially for languages suffering under the

pressure of globalisation. Although there is no one-solution-fits-all, off-the-shelf solution for all languages, the global demand for translation and translation tools, currently surpasses the capacity of available solutions . This necessitated their experiments on translation systems between English and the two Nigerian languages: Igbo and Yoruba. The study is setup to build parallel corpora, train and experiment English-to-Igbo, English-to-Yorùbá, and Igbo-to-Yorùbá, phrase-based statistical machine translation systems. The systems were trained on parallel corpora that were created for each language pair using text from the religious domain. A BLEU score of 30.04, 29.01 and 18.72 respectively was recorded for the English-to-Igbo, English-to-Yorùbá and Igbo-to-Yorùbá MT systems. An error analysis of the systems outputs was conducted using a linguistically motivated MT error analysis approach and it showed that errors occurred mostly at the lexical, grammatical and semantic levels. While the study reveals the potentials of their corpora, it also shows that the size of the corpora is yet an issue that requires further attention. Thus, an important target in the immediate future is to increase the quantity and quality of the data. Their study however, differ from the current one in that while Ayogu, et.al focused on a statistical implication using religion and Nigerian languages, the present study deals with the linguistic analysis within the domain of agriculture and international languages.

Chinenyeze, Bennett and Taylor (2019) claim that access to information written in different languages is very important. As a result , they see translation as the means by which information sharing across languages is made possible. In an increasingly globalized, multilingual and integrated world where much information is generated in various fields they argue that there is an increasing demand for developing automatic means of translating from one language to another to enable efficient communication across cultures.

In their study, Chinenyeze, Bennett and Taylor (2019) strongly believe that developing automatic machine translator for English to Igbo language will be a major boost to economic activities in the territory of the Igbo nation. The objective is to model a language processor that can accept as input text in English language and translate same to Igbo language. Object Oriented Analysis and Design Methodology (OOADM) was used to analyze and develop a feature rich automatic translation system called Bi-Lingual English-to-Igbo Sentence Machine Translation System (BEISMTS). The output of the model was tested on 300 randomly selected English texts. The implementation of this model result in greater access to information dissemination in Igbo language although the study reveals the problems inherent in the current mechanism of translation.

Ezeanyeji, Ebinyasi and Mgbeafulike (2019) through their research, have developed an Igbo to non-African language translation system . The Language Model, Translation Model and Decoder is done in Microsoft Hub; training of parallel document, and the language translation system was implemented in Android studio environment and can be accessed through Android application in smartphones. English and Igbo language tokens were determined using Finite State Automata; transition in each state identified the valid token and invalid. Valid tokens were found where transition produces letters, invalid tokens occur when a transition produce combination of digit and letter. English and Igbo language semantics were determined using attribute grammar which was further expressed in parse tree showing the syntax structure. An integrated custom keyboard was developed to input the Igbo words and phrases. Result shows one to one and one to many mapping of English to Igbo words/phrases. This study seems to relate to the current study from the interlinear sentence perspective and android application product but differ in that while this study examines the agricultural

Rayson, Uchechukwu and Hepple (2020) project focuses on creating and publicly releasing a standard evaluation benchmark dataset for Igbo-English machine translation research for the NLP research community. They complained about the excessive focus on well-resourced languages such as English, Japanese, German, French, Russian, Mandarin Chinese etc., while leaving over 97% of the world 7000 languages, including African languages, at the level of low-resourced for NLP i.e. they have little or no data, tools, and techniques for NLP research. Their project aims to build, maintain and publicly share a standard benchmark dataset for Igbo-English machine translation research . There are three key objectives:

Create a minimum of 10,000 English-Igbo human-level quality sentence pairs mostly from the news domain

To assemble and clean a minimum of 100,000 monolingual Igbo sentences, mostly from the news domain, as companion monolingual data for training MT models

To release the dataset to the research community as well as present it at a conference and publish a journal paper that details the processes involved.

These are great objectives only if the product of the study was made public and accessible for a study such as the present one. Unfortunately, it appears to be as many others, which are difficult to acquire in the public domain.

Studies on Igbo translation

Studies in Igbo translation include Chidi's (2017) study titled *Fidelity Challenges in English-Igbo Translation by Okeke* examines the challenges that may hinder faithfulness in translation between the English and Igbo languages within the framework of the interpretive theory of translation. The study is purely

descriptive and data are derived from the literature as well as from intrinsic evidence. Chidi (2017) establishes that despite the cultural and structural challenges that exist, it is possible to achieve an acceptable level of fidelity in English-Igbo translations within the framework of the interpretive theory of translation. However, Chidi (2017) further notes that within the scientific and the technical domain, there is a universal acceptance of scientific notations and symbols across languages.

Ijioma and Ezeafulukwe (2015) focuses on *Translating technical texts: The Igbo language example*. They observe that translating a text from one language to another poses problem to the translator. According to them, the Igbo language lag behind in the development of technical terms thus creating a wide gap between the English and Igbo languages both linguistically and culturally. Then they employ their article to identify some challenges in translating a technical text into Igbo and suggest the way forward. .

Having established from previous studies that the specialized domains of Igbo language lack appropriately documented information , a linguistic analysis facilitates the provision of lexicographic needs in Igbo language translation.

II. THEORETICAL FRAMEWORK

This study will be based on Interpretive Theory of Translation (ITT). Yunyan (2020) reports that this theory was formulated in the middle of the 20th century by Jean Herbert who was a professional interpreter and one of the earliest researchers. Since the 1960s, many researches have been made to explore the process of interpretation. Jean Herbert divided interpretation into three steps, which are:
Comprehension,
Deverbalization and
Reformulation.

Comprehension means that the translator does not care much about linguistic symbols of the source language. Words, sentences, etc. are meant to store the meaning, which is a non-verbal symbolic form. Therefore, the form of the source language is a simple device used to store meaning, and should not be overemphasized by the translator.

Deverbalisation is the next step and it plays a connecting role between between both comprehension and reformulation but it is more difficult to observe. Gao and Zhu, (2013) explain that it means in the process of interpreting or translating, the translator breaks away from the external form of the source language and extracts the overall information conveyed by the source language. This is like analysing the contents of the linguistic form in the context of usage. A word may mean different kinds of things in different context, it is the duty of the translator to deverbalize the linguistic form and provide which meaning will be most appropriate for the message in the source language.

Finally, reformulation is the process of expressing the meaning in the target language (Zhang, 2011). ITT focuses on the equivalence of meaning. The essential proposition of ITT is that after the interpreter hearing the original language or the translator reads the original text, the sense remains in the brain and the symbols of the source language is almost forgotten, but the translator can express the original meaning in the target language.

III. METHODOLOGY

This study will adopt In Descriptive Research Design, which allows the researcher to explain and describe the data on available software tool. This research design will help to apply the interpretative theory to the contents of English to Igbo software tools, especially the handling of agricultural terms.

Two hundred and thirty English agriculture registers were compiled. Then the words were entered into the machines to isolate their translation into Igbo. The second type of data is data for the software tool to be built. These data were derived from books, on-line resources, correct translations from the software tools mentioned above and words of mouth from Igbo speakers. The researchers intuitively generated some terms ; other words beyond the native knowledge of the researchers were obtained from farmers who use the tools and have a measure of formal education and can understand the English version. Some other words were derived by simply showing pictures to uneducated farmers and asked what the item, plant or animal is called in Igbo.

IV. DATA PRESENTATION AND ANALYSIS

The data gathered for analysis were presented into different sections based on the observations of the researcher on each of the translations. Such sections include cases of omission, regional dialects for translation, translations with errors in linguistic features etc.

The first research question as shown above seeks to identify the linguistic features of agricultural terms aimed at lexicographic information of specialised Igbo language repository. This meenhancing an that I will first show the defects in the linguistic features of available translation software, then explain those of the

software to be presented. This discussion will justify why there is a need for another software tool despite that there are already in existence.

Moreover, though there are three European languages in the software to be presented, only translation between English and Igbo will be discussed here. The reason for this is that I only understand Igbo and English very well enough to do analysis. Therefore, there are two sections. Section 4.1 discusses findings in the available software tools while section 4.2 introduces the linguistic features of the forms in the software tools provided here.

4.1. Linguistic features of Igbo agricultural terms in previous translation software tools
        Two software tools were studied during data collection period. These are Watchtower Library in Igbo and Google Translate. The former is an offline software used by Jehovah's witnesses in their worship, while the latter is a general online software produced by Google for translation into many world languages including Igbo. These two software tools are not fit for specialised agricultural terms. In this section, I will analyse the data derived from them which make them unfit. First is Watchtower Library.

4.1.1 Linguistic features of Igbo agricultural terms in Watchtower Library
        The Watchtower Library in Igbo (henceforth WLI) analysed here is primarily a religious software, which contains all the collections of the publications of Jehovah's witnesses translated to Igbo from 1991 to 2011. As the name suggests, it is meant to be a library not a translation tool. However, it has a synchronisation function that makes it possible to search for equivalents between two languages if the two are installed on a single system. These function is indicated by the red cycle and the arrows in figures 4.1 and figures 4.2 of English and Igbo and English of the software used for these study respectively.
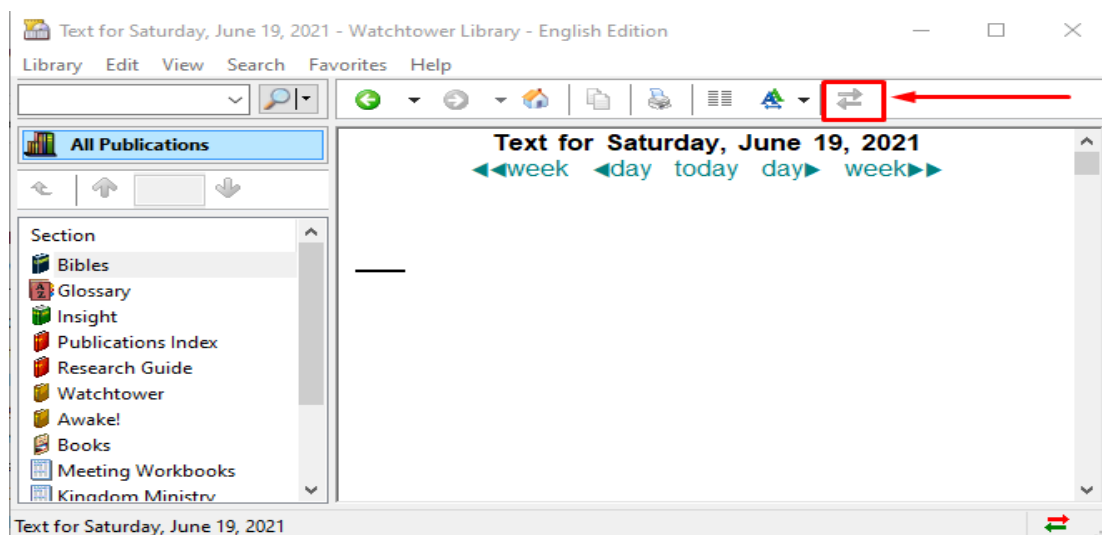

Figure 4.1 Synchronisation function of English Edition of Watchtower Library
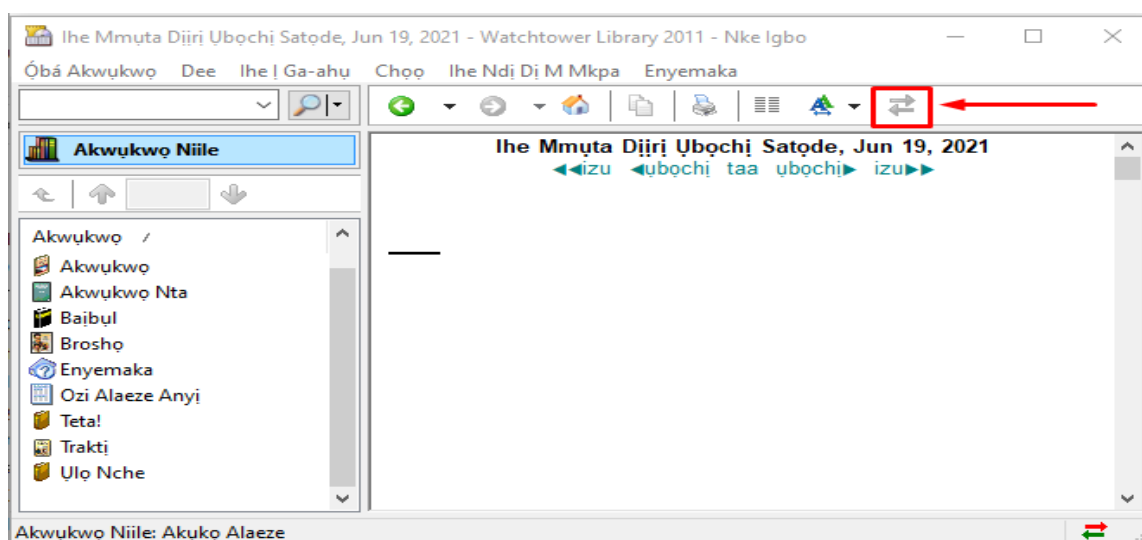

Figure 4.2 Synchronisation function of Igbo Edition of Watchtower Library

The synchronisation function shown above makes it possible to use the software tool for translation purposes. These is done by highlighting a search word from a context of usage in a text, then click on which takes one to where a translation of the word can be found in the same text of a target language. For instance, if the word ' cow' is highlighted from Hosea 4:16 of Bible file and click on the synchronization function, as shown in figure 4.3 below, the translated output of the same verse is highlighted in the Igbo edition of the software as shown in figure 4.4.
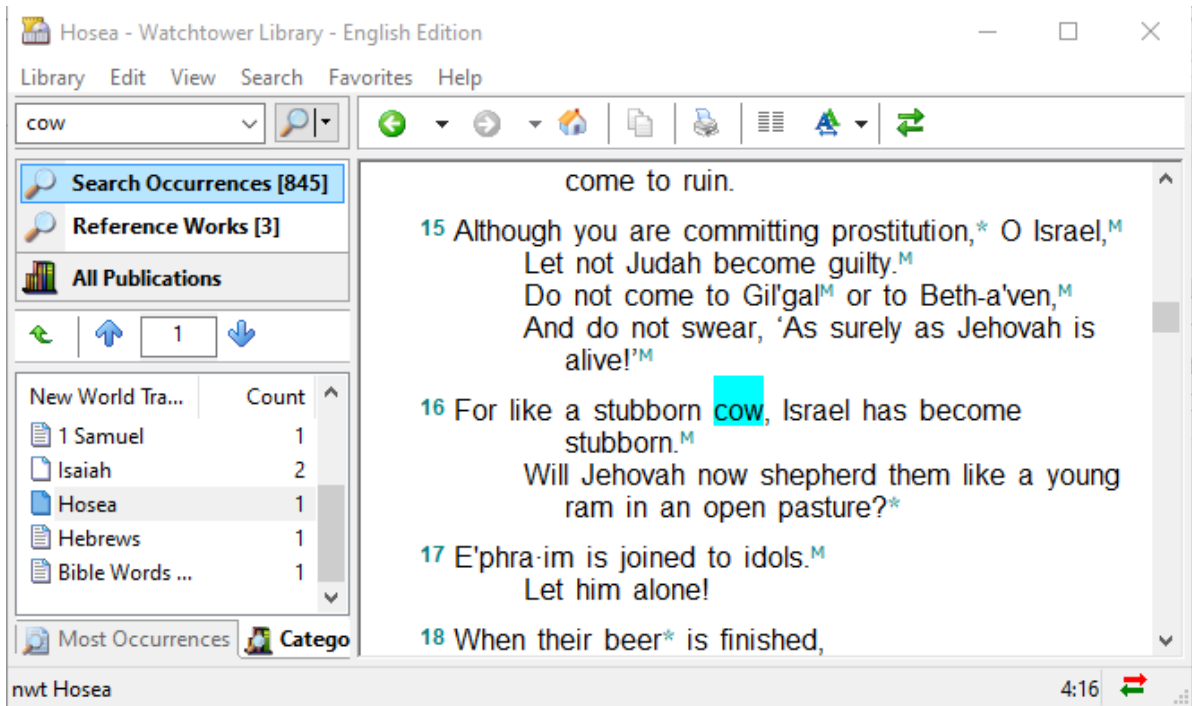

Figure 4.3 Search for ' cow' in Hosea 4:16 in the English Edition of Watchtower Library
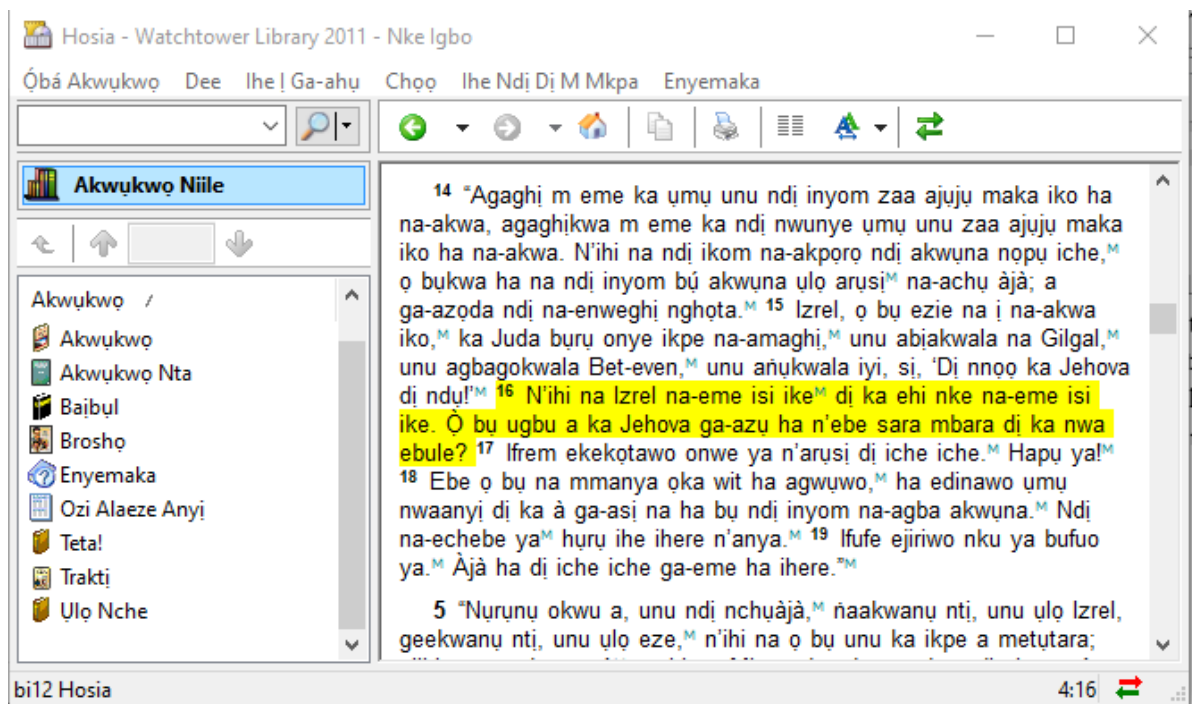

Figure 4.4 Translation of Hosea 4:16 in the Igbo Edition of Watchtower Library

Shown in figure 4.4, the word for cow in Igbo ' ehi' is highlighted along other words in the context it occurs in Hosea 4:16. This indicates that the software is capable of being used for translation. Despite this possibility, it has at least three defects with respect to the linguistic features of Igbo words that make it unfit for

specialized translation of Igbo Agricultural terms. First, WLI is not designed to translate at word level. It can only translate entire sentences or larger texts. For instance, in the figures above, the search word in the source language is ' cow' , which should have an output of single word ' ehi' for cow in the Igbo target language but this is not the case. Instead, it brings out the whole verse, which has two sentences. This shows one important feature of WLI, it is designed for competent speakers of the language. It is impossible to know which word is for ' cow' in the Igbo version if one does not understand Igbo.

This linguistic feature alters the first principle of Jean Herbert' s Interpretive Theory of Translation (ITT), which is **comprehension**. According to Yunyan (2020), comprehension means that words, sentences, etc. are meant to store the meaning, which is a non-verbal symbolic

form. Therefore, the form of the source language is a simple device used to store meaning. Applied to translation software, the device should be able to comprehend the form used in the source language, which is to be translated to the target language. A word form is different from a phrase form or sentence form. If the entry in a source language is a single word but it cannot be isolated in a target language, then the software tool does not comprehend the form that store the basic meaning to be translated.

The second defect in the linguistic features of WLI is that it sometimes gives translation of dialect of Igbo instead of the standard variation of the language. One example is the word 'onion' which is translated as shown in the extract from August 1, 2004 of *Watchtower* magazine below:

Translation of 'onion'.

English

Layers of an onion

 Igbo

Mkpo dị iche iche nke otu yabasị

In the above translation, 'onion' is translated as 'yabasị'. The output word in the target Igbo is not the standard form known to all Igbo native speakers. Instead, the Igbo people generally use 'alịbasa', which is a completely different word from what WLI presents. This alters the second principle of Herbert' s Interpretive Theory of Translation (ITT), **reformulation**, which is the process of expressing the meaning in the target language. Zhang (2011) explains that ITT focuses on the equivalence of meaning. For the output of translation to count as making meaning, it must make sense to all the speakers of the language, not just to the translator or a group of speakers using the same language. For this to be achieved, the forms of the agricultural terms that should be used in any software which has Igbo speakers as audience must use only forms of words known to and use by all speakers of the language, especially the literate population.

Finally, the third linguistic defect of WLI is that it sometimes does verbatim word-for-word translation without considering the intended meaning of the word translated. For example, in the extract from March 1, 2004 of *Watchtower* magazine, we have:

Translation of ' elephant grass' .

English

*We also ate grasshoppers, cassava peelings, hibiscus leaves, **elephant grass**—any leaves we could find.*

Igbo

*Anyị rikwara ụkpara, mkpo akpụ, akwụkwọ okooko osisi hibiscus, na **achara—ahịhịa** ọ bụla anyị hụrụ.*

The Igbo equivalent for 'Elephant grass' is simply ' ahihia achara', yet 'achara ahihia' is the translation given which does not correspond with what is true in the case of the Igbo word. This kind of example does not obey the principle of **deverbalisation** in Jean Herbert' s Interpretive Theory of Translation (ITT). Gao and Zhu, (2013) explain that deverbalisation means the process of interpreting or translating, in which the translator breaks away from the external form of the source language and extracts the overall information conveyed by the source language. This is like analysing the contents of the linguistic form in the context of usage. A word may mean different kinds of things in different contexts, it is the duty of the translator to deverbalize the linguistic form and provide which meaning will be most appropriate for the message in the source language. However, the translator must break away from the form of the source language to choose appropriate form that will conform to the meaning in the source language. That a meaning is expressed in compound noun in a source language does not mean it must be expressed in a compound noun in the target language.

4.1.2 Linguistic features of Igbo agricultural terms in Google Translate

Ishmail and Hartono (2016, p. 1) describe Google Translate as a convenient tool that offers free instant translation service on the web. They proclaim it as being useful in translating words, clauses, sentences, paragraphs, and even a web page between any pairs of supported languages. Moreover, they explain that it can also be utilized to minimize time and effort to do translation tasks because the translation results are instantly generated. With this, it is concluded that the translator is also helped with the easiness and availability of Google Translate, which is online and accessible to anyone and anytime for free with internet connection.

The speed and other merits would have been a great advantage for translating Igbo Agricultural terms if the translation available for Igbo and English online is accurate. However, Google Translate is not standard considering the quantity of translation errors it pops up for Igbo agricultural terms, especially with respect to linguistic features that connect forms with meanings of words, worse than those of Watchtower Library in Igbo analysed above. I will briefly discuss some here.

First, Google Translate confuses words by exchanging their generic meanings. Consider the following examples.

English	Google Translate Igbo
1. Cutlass	*Iberibe ' Foolish'
2. Hyena	*Ahịhịa 'grass'
3. Breadfruit	*Achicha 'bread'
4. Cheetah	*mgbada 'deer'
5. Cocoyam	*Azụ 'fish'
6. Earth Worm	*Ọbara 'blood'

As shown in examples (1-6) above, all the Igbo words used for translating English terms do have their own meanings. For instance, *iberibe* means 'foolish', *ahịhịa* is for 'grass', *achicha* for 'bread', *mgbada* for 'deer' earthworm for 'obara' and *azụ* for 'fish' respectively. None of these words mean what Google Translate claim they mean. These translations alters **reformulation** principle of ITT because they do not give equivalence of meaning. Though each of the translated words has meaning in the Igbo language, their meaning are not the equivalents of the intended ones. To achieve correct reformation, the forms of the agricultural terms that should have been used by Google Translate are provided in examples (7-12) below, forms that are far from those of the translation machine.

English	Igbo
7.Cutlass	Mma
8. Hyena	Nkitaọhịa
9.Breadfruit	Ukwa
10. Cheetah	Mvụrụ
11. Cocoyam	Ede
12.Earth Worm	Idide

Second linguistic feature following still based on the reformulation principle of Herbert's Interpretive Theory of Translation are forms that are completely meaningless in Igbo but Google Translate use them in their rendering English forms to Igbo forms. A case was observed with respect to the Agricultural terms used for this project. These are given in example (13) below.

English	Google Translate Igbo
13.Antelope	*Anụ bela (Correct - Ele)

While *anụ* is equivalent to English 'meat' or 'animal' and nwa means 'child ', 'bela' is not an Igbo word known to me and all Igbo native speakers I asked. Therefore, it fails the translation is meant for in the language. The third linguistic feature that also fails reformulation principle in Google Translate is the use of descriptive phrases that are not related to the meaning of the translated Agricultural terms they are meant for, and even do not make complete sense in Igbo sometimes. See examples (14-17) below:

English	Google Translate Igbo	
14.Africa civet	*Afrịka gbawara	'Africa that breaks'
15.Grasshopper	*Onye na-akpụ ahịhịa	'someone who draws grass'
16. Boa Constrictor	*Ihe mgbochi	'something that
prevents'		
17. Green	*Agba ndụ ndụ	'generation alive alive'

In these examples, the phrases used to translate the Agricultural terms selected do not match the meaning of the English words they are meant for. In fact, each of these words have single word equivalents in the Igbo language. For instance, 'Africa civet' has *Ediụra,* 'grasshopper' is *ụkpara*, 'boa constrictor' translates to *ekeọgba,* and while 'green' is *inine*. This is not to mean that Igbo Agricultural terms in Igbo does not have cases of compound words and multiple words translations for English terms. However, such cases are very few and they make sense to Igbo people rather than the collection of words that mean almost no particular thing.

Fourthly, misspelling is another linguistic feature that disqualifies Google Translate. Some Igbo words used for translating Agricultural terms seem like the real Igbo words for those terms but because they are misspelled, they give either misleading meaning or completely meaningless. Some examples are provided below.

English	Google Translate Igbo
18.Alligator	*Agụ 'tiger'
19.Bee	*Anụ 'animal'
20.Hog	*Ezi 'pig'
21. Cutlass	* Iberibe 'Foolish'

There are two challenges with the Google Translate of Igbo forms above. First are those that give misleading meaning in examples (18-21). This happen because the words are misspelled slightly or majorly. Slight misspelling is in the case of (18-19). For example, the word for alligator in Igbo is spelled *aghụ* with /h/ but by not adding the /h/, the word given means ' tiger' in the language. This is similar to the word for ' bee' , which is spelt *anu* with a dot on the /n/. It seems the compilers of Google Translate do not know the word has a different type of the nasal consonant so they used the word that means ' animal' . Example (20 -21) are major misspelling and misleading meaning in the Igbo language. These include the deletion of important parts. Hog' translates to a word spelt *eziọhia*. The deletion of the other parts for this word as shown in the example leads to misleading meaning. Finally, the case of misspelling show up the case in which the addition of syllables to a word makes it meaningless. The word for 'Cutlass ' is mma but the Goggle translate gave it 'Iberibe ' meaning foolishness, this makes it wrong translation in Igbo language.

The fifth linguistic feature is transliteration, which means word for word translation from one language to another based on the forms in the source language. Examples (22-28) show this linguistic features.

English	Google Translate Igbo	Correct Igbo Translation
22. Bitter leaf	*akwukwo ilu (leaf bitter)	Onugbu
23. House Fly	*nnụnụ ụlọ (bird house)	Ijiji
24.Oil Bean	*agwa mmanụ (bean oil)	Ukpa
25.Palm kernel	*mkpụrụ osisi nkwụ (fruit palm)	Akị
26.African Cherry	*Cherry nke Afrịka	Ụdara
27.African mango	*Mango nke Afrịka	Ọgbọnọ
28.Bitter Kola	*Kola ilu (kola bitter)	Akilu

The sixth of the disadvantage of Google translate for Agricultural terms is unnecessary borrowing from English. There are forms in English that have equivalents in Igbo. These forms are not translated with the available Igbo forms but with borrowed words from English. See some examples below:

English	Google Translate Igbo	Correct Igbo Translation
29.Egret	Egret	Chekeleke
30.Caterpillar	katapila	Egu
32.. Jute	Jute	Ahịara
33.Mango	Mango	Ugiribekee

As shown in these examples, all of the borrowing here are not needed because Igbo has its own words for all the terms.

4.2. Linguistic features of Igbo agricultural terms present translation software tools
    As shown in the correct translations presented in addition to the Watchtower Library and Google Translate words above, the data used for the software tool in this project obey the three linguistic features of Jean Herbert' s Interpretive Theory of Translation (ITT), which are comprehension, reformulation and deverbalisation. In this section, I will introduce them based on their linguistic structures. The Igbo Agricultural terms that are used in the present software tool fall into three groups based on the nature of their linguistic structures. These are: (1) simple forms, (2) and (3) multiple word forms. All of these are explained below with examples drawn from the data for the software.

4.2.1 Simple forms
Simple forms are single words that are equivalents of some agricultural terms in other languages. Like before, in this section, I will use Igbo and English. Some examples are given below:

Igbo	English
35.Adụ	Aerial Yam
36. Ele	Antelope
39.Nje	Bacteria

40.Nkata	Basket
42. Ụsụ	Bat
43. Agwa	Beans

Out of the 230 Agricultural terms used for this project, 164 are simple words. This means that this is the most productive of the four categories of words. These are root nouns without the attachment of any other morphemes or words. They testify to the fact that most of the Agricultural terms in English and other world leading languages are also found in Igbo as root words that are not borrowed. They are traditional terms. They mostly include words for things like animals and plants found in the Igbo language.

4.2.2 Compound forms
Compound forms are a combination of two words to form equivalents of Agricultural terms used in other languages. They are the second most common word forms used in expressing Agriculture. There 56 among the 230 words used for this project Examples are presented below.

Igbo	Compound parts	English
44. Ube bekee	Ube + bekee (pear + white/foreigners)	Avacado pear
45.Ọbaji	Ọba + ji – (collection + yam)	'Barn'
46. Iheubi	Ihe + ubi - (Thing + farm)	' Crop '
47.Ịnyịnya ibu	Ịnyịnya + ibu - (horse + load)	'Camel/Donkey'
48.Alaụrọ	Ala + ụrọ - (land + mud)	'Clay soil'

In the examples below, two word roots are combined to form the equivalent for single Agricultural terms. One thing common to almost all the compound forms in the data for software as represented in the few examples provided above is that the Agricultural term they are used for are often particular types or subtypes of either animal, plant, place or equipment used for Agriucltural activities. For instance, *ubeoyibo* is a type of pear, *ọbaji* is a type of store where yams in particular are kept, iheubi is thing gotten from the farm/garden and *ịnyịnyaibu* is an animal while *alaụrọ* is a specific kind of soil.

There are just five words in this category, the compound forms data collected with known meaning. To repeat, compound forms are used to express specific types of an animal, plant, or other Agriculture related terms.

4.2.3 Multiple forms
Some Agricultural terms in Igbo go beyond single words or compound. These include terms that are expressed in phrases or even whole sentences. This means that the Igbo speakers do not have words for them, instead they express them using descriptive multiple words units. There are about 10, and the some of the examples found in the data are given below.

Igbo Multiple Words	English
49.Ala ịta ahịhịa	'Pasture'
Ala(land) ịta (feed/eat) ahịhịa (fodder).	
50. Ụlọ ọzụzụ ọkụkọ	'Poultry'
Ụlọ (House) ọzụzụ (raise /breed) ọkụkọ (fowl)	
51.Igwe eji egwu ala	'Shovel '
Igwe (instrument) eji (use) egwu(dig) ala (ground /land)	
52. Onye ọrụ ugbo	'Farmer'
Onye(someone) ọrụ (work) ugbo (farm)	
53. Ihe eji ekpopu ala nwere ọnụ ọgụ	' Spade'
Ihe (something)eji (use)ekpopu (dig) ala(ground /land) nwere(has) ọnụ (mouth) ọgụ (hoe)	

V. CONCLUSION

The main conclusion in this project is that there is need for new software tool for translating Igbo Agricultural terms to advance the global status of the language which will not only preserve the language from extinction but it will also empower it to compete with other languages such as English, German, French, among others.

The present study has contributed to the knowledge and development of the Igbo language and culture in many ways. First, the study has shown clearly that available software tools are not adequate to carry out proper translation. For instance, Google Translate has been shown to display a major flaw of not being done by Igbo linguists who are native speakers. These led to observable wrong information on Agricultural terms. In summary, is found that Google Translate is not the best for Igbo Agricultural terms for six reasons. These are:
Confuses words by exchanging their generic meanings
Uses completely meaningless forms in Igbo in rendering English forms to Igbo forms
Uses of descriptive phrases that are not related to the meaning of the translated Agricultural terms they are meant for.

Misspells Igbo words, giving misleading meaning or completely meaningless.
Does word for word transliterate of forms between English and Igbo.
Borrow from English when it is not needed.
The same can be said of the software with translated text used by Jehovah's witnesses. For this other software, three levels of ignorance were observed. First, in some instances of their translation, they used dialects instead of standard Igbo. Second, they used phrases and clauses for terms that have specific single word or compound equivalents in the Igbo language and is not designed to translate at word level, which shows that is only meant for competent speakers of Igbo language.

5.2 Recommendations
This study makes the following recommendations:
Similar studies should be carried out on other registers such as commerce, government, religion, science and technology, among others as well as building software tools that have interleaner translation between Igbo and world most spoken languages for these registers.
Translation companies should employ and work with linguists who are native speakers of the Igbo language. This will prevent not just errors in the translation but enhance the linguistic features of the words. For instance, despite that those who translated for Google Translate may be Igbo native speakers, the demerits identified above would have been avoided if they are professional linguists who study the language.

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