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Translation and Democratisation of Knowledge: Translation in Akan (Twi), A Remedy to Improve Cocoa Farmers' Predicament

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Abstract

Translation bridges communities, continents, and worlds that were previously unaware of one another's existence. It is through translation that the transfer of knowledge from one society to another becomes possible. This implies that inventions and scientific advancements from one part of the world can be more effectively disseminated through the work of translators. This paper explores how agricultural knowledge can be made accessible to cocoa farmers through the Twi dialect of Akan. Spoken by more than 80% of the Ghanaian population, Twi serves as a crucial medium for communication among farmers. Translating agricultural labels and documents into Twi would significantly enhance farmers' understanding and application of agricultural knowledge. Although English is Ghana's official language, Akan (Twi) plays a vital role in the Western, Ashanti, and Bono regions, particularly among cocoa farmers. Given the linguistic realities of these regions, there is an urgent need to translate agricultural documents, labels on chemical products, and other essential agricultural terms and practices into Akan (Twi). This initiative aligns with Sustainable Development Goal 17, which advocates for equal justice and opportunities for all, including access to information through language. This research is conducted within the framework of the 1992 Constitution of the Republic of Ghana, specifically Articles 19(2), sub-clauses (d) and (h); 26(1); and 39(3), as well as the Universal Declaration of Linguistic Rights. Ultimately, this paper seeks to strengthen the principle of information accessibility, which is crucial for enhancing farmers' productivity, particularly in the proper application of pesticides.

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Introduction

The right to education is essential. Linking civil and political rights to economic, social and cultural rights, it will therefore be enshrined in the Universal Declaration of Human Rights (art. 26). But the Declaration also provides, as an extension of freedom of opinion and expression, the right to receive and impart information and ideas regardless of frontiers. In other words, the democratisation of knowledge is essential for social inclusion (Delmas-Marty, and Massit-Folléa 2).

The concept of democratisation of knowledge is central and crucial to giving the majority of Ghanaians access to scientific knowledge in agriculture. This is because many Ghanaians are peasant farmers whose livelihood is tied to agriculture. This concept will lead to the establishment of a viable Ghanaian society, helping millions of our citizens to contribute and share the fruits of knowledge explosion in a just, equitable and honorable fashion. Translation is a bridge through which knowledge such as discoveries, information, and culture cross from one end to the other. Translation is recognized as serving the common good, a fact acknowledged by an increasing number of scientists, policymakers, and researchers. Simply put, inventions and scientific knowledge from one part of the world are vulgarized through the work of translators.

This paper aims to reflect on how agricultural knowledge can be disseminated among a people where majority of them can only express themselves in the Twi dialect of Akan. We cannot be oblivious of the fact that language plays a very significant role in this democratisation endeavour. Besides the English language, which is the official language of Ghana, Akan (Twi) is also central to carrying this knowledge transfer agenda as it is the most spoken language by the rural folks in Ghana. We contend that through the Twi dialect, farmers will be able to apply chemical products such as fertilizers, weedicides, and pesticides correctly into their farms without causing injury to crops, lands, and the environment. If we want many Ghanaian farmers to get access to agricultural technology, the only way to do it is to translate major and relevant research findings, inventions and agronomic knowledge and chemical labels into Akan (Twi).

As a result, we attempted to translate some labels on fertilizers and pesticides such as ASAASEWURA, AND AKATEMASTER respectively to ascertain first their translatability into a local language and secondly demonstrate the need for translation into Twi and how the latter can help spur the pace of knowledge among cocoa farmers in the western region. This research is of prime importance as it may reveal the realities of misapplication of fertilizers, overuse and abuse of weedicides and pesticides which result in the slow death of cocoa farms with a tendency of reducing production and

yield. If this behaviour is not stopped, misapplication of chemicals in cocoa farms could deepen the woes of Ghana cocoa production as the country is struggling to halt other activities like illegal mining. In many circumstances, the farmers complain of low yields and as such, some end up leasing portions of their farms to 'Galamseyers' (illegal miners) for sustenance. There are a lot of challenges in the cocoa industry as it stands, and cocoa farmers feel the brunt of these challenges, little wonder farmers sell their farms to illegal miners, or even sand winners. The country's cocoa industry faces many challenges, and these unfortunate incidents give rise to the reality of the state of the industry today and how it requires some urgent attention. Cocoa is the leading contributor to GDP and a national asset that must be protected at all costs. The study will clarify some key concepts, tackle the issue of translatological equivalence, sociolinguistic context of the study, methodology of the work, analysis, and discussions, and will end with some recommendations.

1. Equivalence in Translatology

Since time immemorial the notion of equivalence has been at the heart of translatology. If we consider the omnipresence of other related notions such as fidelity or quality in translatology, then we agree that, since Cicero (46 BC), the constant concern that guides the translator throughout the process lies in this crucial question: how is the translator able to produce the same effects in the target text as in the source text? Hence the need to study equivalence in translation. As an object of research, equivalence has less to do with the process than with the result of the process. This characteristic brings it into line with the skopostheorie, developed by (Vermeer 1989), which goes beyond the process and purpose of translation to focus on the outcome. Gonzalez identifies nine types of equivalence: pragmatic, functional, dynamic, semantic, formal, linguistic, paradigmatic, stylistic and referential. Each type represents a distinct approach to achieving equivalence, aligned with Eco's notion of "saying almost the same thing" (Eco 2001) as the original text.

But, at the same time, we know that no matter how hard the translator tries to establish a relationship of total identity between the two texts, we always end up finding that the translation is not the original' (Mounin 1996). This is why, in applied translatology, the study of the notion of equivalence does not advocate absolute conformity between the text and the translation, but only aims to establish a semantic convergence likely to produce the same effects on the target text just as on the source text. Conveying the message into the target language of the original meaning is carried out and facilitated using various linguistic and non-linguistic means whose sole aim is to shape

the target text into a value regarded as equal to the first. To this end, for the analysis of translations of products labels found on chemicals, this study is particularly interested in whether the information on chemical products can be translated into the local language of Akan (Twi) to establish equivalence 'that makes it possible to reconcile fidelity and freedom in the process of transferring meaning' (Guidère): Functional equivalence. It is difficult to make a clear distinction between pragmatic, functional and dynamic equivalence, as the objectives of translation can be so closely intertwined: i.e., to succeed in eliciting in the final recipient the same reactions or effects obtained by the original text. Functional equivalence presupposes, as the qualifier indicates, that the translator endeavours to restore or make the final text assume the same function as the original.

Functional equivalence does not, however, neglect in absolute terms the relative and dynamic nature of translation according to the context in which it is received; it allows us to understand the process of transferring the vouloir-dire (thing meant) not as a mathematical operation in which the values of a given set must be equivalent to those of another which would constitute a perfect replica of it, but simply as work on meaning with an essentially communicative aim. The translator's primary concern is the function assigned to the text he or she is called upon to translate; his or her faithfulness to the meaning of the original text depends more on his or her ability to produce the same effect in the reader than on successfully juxtaposing lexical and grammatical elements whose unambiguous nature cannot be guaranteed in the context of reception. During this task, linguistic and extralinguistic resources may be called upon to varying degrees, depending necessarily on their respective weight in the production of the initial function of the translated text.

In the case of labels on chemical products, functional equivalence will ensure that the translated texts communicate the same meaning, intent, and emotional impact as the original text, while adhering to legal, safety, and cultural standards. This includes **Safety and Compliance**: Chemical product labels often include vital safety instructions, hazard warnings, and usage guidelines. Functional equivalence ensures that these details are accurately translated to prevent misuse or accidents, while complying with the regulatory requirements of the target market, **Clarity and Accessibility**: Labels must be clear and understandable to users in the target language. Functional equivalence helps adapt technical terms, symbols, and instructions to ensure they are accessible to the intended audience without losing their original purpose, **Cultural Relevance**: Some symbols, phrases, or instructions may not be universally understood. Functional equivalence allows for the adaptation of these elements to align with the cultural norms and expectations

of the target audience, ensuring effective communication, **Brand Integrity**: Maintaining the functional equivalence of labels helps preserve the brand's reputation and trustworthiness by ensuring that the product's information is consistent and reliable across different languages and regions.

The hermeneutic effort, for its part, is mainly subject to the very nature of the source text or utterance. This is even true since the translation of idiomatic or tropological expressions involves less in-depth interpretation than a simple search for ready-made equivalents in the target language. In view of the above, we agree with (Bassnett 24) that translation only achieves functional equivalence when it succeeds in establishing a comparable relationship between:

- Linguistic signs: although often considered ineffective in the search for equivalences, the establishment of networks of correspondences between the two texts can sometimes be the main resource.
- Linguistic signs and their meaning: a second stage in the interprÉtation process could be the contextual decoding of the various linguistic signs to understand their respective semantic value; the translator will endeavour to find the contextual relationship between the signs and their referents.
- Linguistic signs, their meanings and their users: in order to establish the identity of the source text at the point of reception, it is not enough to derive meaning from the various signs that make it up; rather, the translator's role is to ensure that, on the one hand, the signs converge towards the same message and, on the other hand, that the message fulfils the same communicative function for the final receiver. The functionality of the messages on products labels in our corpus lies largely in its vocal and informative nature.

2. Democratisation of Knowledge

The translation of agrochemical labels plays a pivotal role in the democratisation of knowledge by ensuring that critical information about these products is accessible, understandable, and usable to a diverse range of farmers, regardless of their linguistic or cultural background. Democratisation includes **accessibility of information**: By translating labels into multiple languages, farmers, agricultural workers, and consumers in different regions can access vital details about the safe and effective use of agrochemicals. This includes application instructions, dosage, and storage practices, which help reduce misuse and its associated risks; it also e**mpowers local communities**: Translation enables small-scale farmers or those in rural areas- often with limited literacy in dominant languages—to understand agrochemical

information in their native or commonly spoken languages. This knowledge empowers them to make informed decisions and use these products efficiently. Moreover, it contributes to safety and environmental awareness: Properly translated hazard warnings and environmental impact information ensure that users are aware of potential risks to their health, communities, and ecosystems. This contributes to improved safety standards and more responsible handling practices worldwide. Last but not least, equal opportunities for growth: By providing equal access to knowledge, translation helps level the playing field for farmers in developing regions. It fosters better agricultural practices, leading to increased productivity, food security, and economic growth. Finally, it bridges knowledge gaps: Translation facilitates the flow of scientific knowledge embedded in agrochemical labels, allowing the latest advancements in agriculture to reach a global audience. This helps narrow the gap between regions with advanced agricultural systems and those with less access to such innovations. In essence, translated labels act as a bridge, breaking down linguistic barriers and promoting the equitable distribution of knowledge that is crucial for sustainable agriculture and global progress.

Knowledge and power are inextricably close. Access to knowledge, starting with the right to education, dictates the proper use of representative democracy, but the right to information favours the participatory - or even interactive - form, if the appropriation of the Internet were to bring governors and governed together in a single "Internet governance". From public debate to online debate, the networks of powers, those that are organised between established powers, are already being shaken up by the power of digital networks that bring together various social players without hierarchy and turn the playing field upside down (Delmas-Marty, and Massit-Folléa 2).

The democratisation of knowledge is the acquisition and spread of knowledge amongst the common people, not just privileged elites. Libraries, in particular public libraries, and modern digital technology such as the Internet play a key role, as they provide the masses with open access to information. Over the centuries, dissemination of information has risen to an unprecedented level. The start of this process can be marked from the printing press, the purpose of which was to spread information uniformly among the masses. Today, in a digitized world, the availability of online content outnumbers the information published in books, journals or in any print form (Delmas-Marty, and Massit-Folléa 2).

The first world report "Towards Knowledge Societies" (November 2005) asserts that knowledge has become a key resource for development, and that it «cannot be reduced to a commodity like any other», emphasizing, alongside scientific knowledge, "the importance of certain forms of identity

or cultural knowledge that are in some way conveyed by the humanities or certain forms of local knowledge." Putting knowledge at the service of empowerment and capacity building should therefore lead to sustainable human development (Delmas-Marty, and Massit-Folléa 3). The old dividing line between those who have acquired and sometimes invented new knowledge and the knowledge in action, lived knowledge passed down from generation to generation is thus becoming blurred through a sharing of knowledge that calls for an overhaul of intellectual property rights. But democratisation is not uniformity. It could even help to correct the standardising effects of a globalisation driven exclusively by markets, preserving the pluralist vision that the poet Édouard Glissant calls "mondialité" (Delmas-Marty, and Massit-Folléa 3). In other words: from the cross-fertilization of knowledge to the dialogue of cultures. Now firmly enshrined in international law, the principle of cultural diversity marks a shift from the information society to "knowledge societies." Refusing to favour a single model of knowledge, which would be imposed from North to South, UNESCO recognized in 2005 «the importance of traditional knowledge as a source of intangible and material wealth, and in particular the knowledge systems of indigenous peoples, and their positive contribution to sustainable development, as well as the need to ensure their adequate protection and promotion» (Delmas-Marty, and Massit-Folléa 3). According to Delmas-Marty and Massit-Folléa, globalization creates unprecedented conditions for cultural interaction (3). Hence the observation that the processes of globalization, facilitated by the rapid development of information and communication technologies, are creating "unprecedented conditions for interaction between cultures, representing a challenge for cultural diversity, particularly with regard to the risks of imbalance between rich and poor countries."

3. Sociolinguistic Context

Many languages are spoken in Ghana making it a heterogeneous country. These languages are made up of many dialects which serve different functions in different communicative contexts. Three languages have emerged as the most prominent ones used in communication, namely English, Akan and Hausa. Ghana shared border with three francophone countries such as Burkina-Faso in the north, Togo in the east and Cote d'Ivoire in the west. Akan belongs to the Kwa group of languages and spoken in Ghana, Togo, and Cote d'Ivoire. Apart from Ghana, Akan is the largest ethnic group in Cote d'Ivoire with about 32% of speakers.

Researchers do not agree on the exact number of languages spoken in

Ghana as the main issue revolves around the definition of a language. For instance, (Boadi 49) argues that there are more than forty languages in Ghana; (Spencer 2) puts the number at thirty languages, Eberhard suggests that there are 81 languages. Scholars in the like of Dakubu think that the number of languages is between 45 and 50 (Dakubu). Finally Bamgboṣe (2) puts the total number of languages at fifty-seven. Obviously, there are notable discrepancies as regards the number of languages in Ghana. This is because they do not all agree on what is termed as a language. Classification of language depends on one's definition of language and dialect. Granted that scholars have various views regarding the definition, any classification of languages is bound to have problems.

However, among all the languages and dialects spoken in the country, Akan (Twi) stands as the major lingua franca. The name Akan was used in the 1950s to refer to an umbrella of dialects: Akuapem, Asante, Fante, Wassa, Agona, Akyem, Bono (Abron), Kwahu and Gomua (Obeng 3). Bono Twi and Asante Twi are spoken both in Cote d'Ivoire and Ghana where they are called Abron (Obeng) and Baule (Allou) respectively. Almost all the Akan dialects are mutually intelligible; Akan is the most spoken language with the largest amount of written and creative literature. It is widely studied and documented with a wider audience more than any other language in Ghana. All the languages spoken within Ghanaian borders belong to the Niger-Congo family; according to the 2021 national census, Akan[1] is the native language of about 48% of the Ghanaian population, which is also spoken as a second language or as a lingua franca[2] by at least 80% of Ghanaians.

Akan is a language of prestige which is used in schools as a medium of instruction in addition to English in communities such as the Guan language areas: Larteh, Anum, Bosso, Ewutu (Efutu), Winneba, Adukrom (Obeng 3), and among the Senufo (Nafaara), Kulango, Ligbi and Mo (Deg) communities in the Bono and Bono east regions. Furthermore, even some schools within the Greater Accra regions also use it as a language of instruction in their schools, in churches and it is the language of trade present and spoken in almost all the major markets across the country.

Languages such as Ga, Dangbe and Ewe, Nafaara, Mo, Ligbi, Gonja, Kulango and Bassari have all borrowed extensive vocabularies from Akan, and this by and large shows the prestigious nature of the language in these areas. Also, in the Western Region of Ghana, especially among the Sehwi, Anyi, Ahanta, and Wassa, it is used as a medium of instruction in schools.

[1] Figures extracted from the 2021 Ghana Statistical Service report p. 9

[2] By lingua franca I mean a (simplified) variety of language which is used in communication between speakers who have no native language in common. The term is employed here as a synonym of vehicular language

Dakubu (1973) cited in Obeng argues that the languages adjacent to Akan have borrowed words from areas pertaining to sea-fishing, statecraft, food and personal names derived from names of the day and week on which the person was born. For instance, Kwadwo, Kwabena, Kwaku, Yaw, Kofi, Kwame and Kwasi for Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday male children respectively. However, there is no evidence that Akan has been influenced by the aforementioned languages. Even though Ghana is a multilingual country, Akan and English remain the most spoken languages in the country.

4. Objectives and Methodology

a. Objectives

The work revolves around three main objectives. It first seeks to establish the importance of translation as a way of knowledge democratisation among Ghanaian farmers in the Western Region. Secondly, the paper aims to determine whether there is a correlation between the death of plantations and misapplication of chemicals and fertilizers due to language barrier. The third objective is to find out whether Akan (Twi) is an alternative to the English language on chemical labels. Thus, the following research questions are raised:

1. What is the importance of translation as a way of popularizing knowledge among cocoa farmers?
2. Is there any connection between the death of cocoa farms and chemical misapplication?
3. Is translating chemical dosages and indicators on products labels into Twi a panacea to solving farmers' linguistic barrier?

b. Participants

This study was conducted using the qualitative method of data collection. Here a semi-structured telephone interview and observation were used to gather data from farmers in the western region of Ghana. In the semi-structured interview conducted for the purpose of this work, both the researcher and interviewees agreed on the modalities of asking the questions. For instance, we agreed that the interview was going to be semi-structured and not structured. It affords both the researcher and interviewees the opportunity to engage in a frank discussion. The participants are Ghanaian peasant farmers, randomly selected from the cocoa growing areas of Samreboi District, Tarkwa Nsuaem Municipal District and Ellembelle district, all in the western region of Ghana. Even if many farmers are school dropouts, Junior High School and Senior High School leavers, their English proficiency leaves much to be desired. This impedes their ability to read and understand English.

In all, ten (10) farmers were interviewed from Samreboi district and three (3) farmers from the Ellembelle district and seven (7) farmers from Tarkwa Nsuaem District to get their opinions about the administration of fertilizers and chemical products in their farms. Interviews bordered on farmers' level of education, their opinions on translating fertilizer and chemical labels from English into Akan (Twi). Interview questions consist of having a telephone exchange with participants by verbally asking them a series of questions relating to a situation, their opinion, their expectations, their level of knowledge or awareness of a problem, or any other point of interest to the researcher. It requires verbal responses. Given that the method of administration adopted will necessarily have an impact on the rate and even the quality of the responses collected, we have opted for the telephone approach. This is because the areas are far remote from Accra and require a lot of resources to get there. In this way, we got the numbers of participants from two friends who are farmers in these respective areas whose numbers enabled us to contact the interviewees on phone to hold a frank discussion with them.

However, given some factors specific to our framework for conducting the interviews, we adopted a telephone approach for the participants that we will describe as sequential; the interviews were done in two sequences spaced out over a variable period, depending on the availability or accessibility of the farmers to be interviewed. Although it is possible, in theory, to apply random sampling methods in large studies based on interviews, the aim is rarely to generalize to wider populations but rather to provide rich and diverse information from key participants. To achieve this goal, purposive sampling, where participants are selected based on principled criteria to cover the key aspects of the research question, is more effective. In all, twenty farmers were interviewed from three districts namely, Samreboi District, Tarkwa Nsuaem District and Ellembelle District.

Furthermore, a market survey was also carried out in most agrochemical shops to establish the main languages of the labels. In all, three (3) agrochemical shops were visited in and around Greater Accra Region: Madina, Accra and Adentan constituencies. Chemicals of interest were fertilizers, herbicides, pesticides, and fungicides. The labels were carefully examined to ascertain the various languages in which the information is written. We then proceeded to the Bureau of Ghana Languages, which is tasked with the responsibility of translating government policies into the local languages. The objective was to engage the translators about the types of agricultural documents they translate and ascertain whether there is a policy that compels the government to democratize knowledge in these cocoa growing areas.

5.0. Corpus and Data Analyses

5.1. Features of Product Labels

Basically, the aim of product labels is to draw the attention of potential consumers to how and when the product is used. Labels provide vital information to consumers about ingredient details, nutritional facts, usage instructions, and safety warnings. By conveying essential details, labels can influence consumers to make wise choices about the products they buy. They serve as a direct information channel between brands and consumers, conveying necessary details and building brand identity. Product labels influence purchase decisions, help businesses avoid legal liabilities, and differentiate products from competitors. A well-designed label can captivate shoppers and pique their interest. By leveraging effective label design, brands can effectively communicate product features, benefits, and value to create a strong impact on consumers.

Products labels can take several forms, three of which are discussed for the purposes of this study: informative, persuasive and descriptive. When it is informative, the aim of product labels is to convey information about a service or product to the consumer, in the hope of encouraging a rational attitude that will lead to proper usage. Informative labels put forward rational arguments about the product or service on offer with the aim of protecting consumers against possible side effects associated with the product. Product labels are generally designed to inform and persuade rather than argue. However, they can sometimes become a point of contention, especially when they involve controversial topics like genetically modified organisms (GMOs), health claims, or environmental impact. For example, labels on GMO foods have sparked debates about transparency and consumer rights. Some people argue that such labels are necessary for consumers to make informed choices, while others believe they can be misleading or unnecessary.

In essence, while the labels themselves are not argumentative, the information they present can lead to debates and differing opinions among consumers, manufacturers, and regulatory bodies. Descriptive labels, on the other hand, provide detailed information about a product, such as its features, benefits, usage instructions, ingredients, and other relevant details. These labels aim to give consumers a clear understanding of what the product is and how to use it effectively: the characteristics of the product to be marketed, or the service to be offered to the public. These characteristics are generally presented in the slogan, the product tagline or simply in the paratext of the subject of the label. Products labels just like Advertising discourse, which

(Everaert-Desmedt) sees as a 'locutory act invested with a double illocutionary force', thus assumes various sub-functions all designed to achieve the same goal: to generate perlocutionary effects such as making the public believe or doing (Bonhomme). Most of the labels in our corpus are part of this approach.

For the purposes of translation, the choice of a text to be used as the raw material for the empirical process is a delicate phase, with real scientific implications. Depending on the objectives of the study, these criteria should be determined in such a way as not to create any bias either in the apprehension of the level of English proficiency of farmers, or in the assessment of the degree of difficulty they encounter in the application of these agrochemicals and fertilizers in their farms given that the labels are written in English. Our corpora include a variety of texts written on agrochemical labels such as fertilizers, weedicides and pesticides used by farmers in their farms. These include COCOBOD approved and recommended fertilizers such as ASAASE WURA, NITRABOR, SIDACO, COCOA ADUANE, COCOA AHUODEN; and pesticides/fungicides: COCOSTAR, AKATEMASTER, CONFIDOR, CHAMPION, ACTARA, etc.

5.2. Data analysis

The analysis of the various labels on agrochemicals is a crucial phase in the development of the empirical part of this study. Considering our set objectives, we will provide a translated version of the government approved and recommended agrochemicals and fertilizers on the labels into Akan (Twi). We juxtaposed the written English labels with the Akan (Twi) translation. This enables us to analyse the texts based on our set objectives.

ENGLISH	AKAN (TWI)
PESTICIDE	**Nnuro a akuafoɔ de gu wɔm mfudeɛ so kum mmoa a wɔsɛe nnuane no**
AKATE MASTER; Active ingredient: 27 G/Lt bifenthrin; Target Crops.	**AKATE MASTER;** Nneɛma titire a wɔde yɛ aduro no: 27 G/Lt bifenthrin; Mfudeɛ a yɛde aduro yi bɔ no ban;
Pests: Capsids and other bugs;	Mmoawa a wɔsɛe nnɔbae: Capsids ne mmoawa afoforɔ;
Rate of Application: 0.5 Lt/Ha	Nuro no dodoɔ a wɔde di dwuma: 0.5 Lt/Ha
Description: Broad spectrum	Nkyerɛkyerɛmu: Nneɛma bebree
LIQUID FERTILIZERS	**ƆYƐASAASE YIE NSUO**

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APPLY
When the crop is wet or in the rain

In the dry
In wind so long as streams are not being deflected
Keeping forward speed slow and pressure low
In the evening or early morning if possible

Plan to complete your applications by GS32 (2nd node on stem detectable) on cereals.
In sequence: Apply fertilizer first and agrochemicals second. Leave a 2-day gap if possible.

Keep grazing stock out for 5 days if there has been no rain.

AVOID

When the crop is just damp and drying off – this may lead to a smear of nitrogen drying on the leaf, leading to too much leaf uptake.
In wind once feathers of small droplets are being blown from the mainstream, or if the wind has caused leaf bruising.

Going above 2 bar pressure unless you really have to.
In the heat of the day or when >20°C between max and min is expected

Don't apply to the flag leaf (or leaf 2 if possible)
In sequence, don't apply agrochemicals first – they are likely to de-wax the leaves and increase to risk of foliar uptake of N. Leave a 5 day if possible

FA ADURO NO YƐ ADWUMA
Berɛ a nnɔbae no afɔ anaasɛ ɛgu nsuo mu
Wɔ berɛ a awo
Wɔ berɛ mframa rebɔ bere tenten a wɔmfa nsubɔnten nkɔ baabi foforo no
Ahoɔhare a wɔde kɔ anim a wɔbɛma ayɛ brɛoo na nhyɛso a ɛba fam
Anwummere anaa sɛ ɛbɛyɛ yie a anɔpatutuutu

Yɛ nhyehyɛe sɛ wobɛwie wode GS32 bɛgu wo aburoo ne cereals so

Wɔ nnidiso nnidisoɔ: Fa ɔyɛasaase yie di kan gu so ansa no wode nnuanenuro a wɔde yɛ kua agu nea ɛtɔ so mmienu so. Sɛ ɛbɛyɛ yie a, gya nnafua (2) mmienuto ntam
Ma mmoa a wɔredidi no nkɔ so nnafua num (5) nim sɛ nsuo antɔ a

GYAE ADURO NO GU

Sɛ nnɔbae no fɔ kakra na sɛ ɛrewo a- ɛyi bɛtumi ama nitrogen a abɔ apete ahaban no so, na ama ahaban no agye dodo.

Wɔ mframa mu bere bi na wɔrebɔ nsu nketenkete ntakra afi asubɔnten kɛse no mu, anaasɛ sɛ mframa no ama nhaban no abubu a
Kɔ soro sen bar pressure mmienu gye sɛ ɛsɛ sɛ woyɛ saa ankasa
Wɔ da no mu hyew mu anaasɛ bere a wɔhwɛ kwan sɛ >20°C wɔ max ne min ntam
Mfa frankaa ahaban (anaasɛ ahaban 2 sɛ ɛbɛyɛ yiye a).
Wɔ nnidiso nnidiso; Mfa nnuru a wode yɛ kua nni kan, ɛda adi sɛ ɛbɛma nhaban no akɔ soro ma asiane a ɛwɔ hɔ sɛ nhaban bɛfa N. Gyae da num sɛ ɛbɛyɛ yie a

Don't dilute liquid nitrogen, it increases the risk of scorch.	Mfa nitrogen a ɛyɛ nsu no nhyɛ mu, ɛma asiane a ɛwɔ hɔ sɛ wobɛhyew no yɛ kɛse
Avoid application onto damp crops or after a hard frost.	Kwati sɛ wode bɛgu nnɔbae a afɔ so anaasɛ ntɔnsuo a ɛyɛ den agugu so
ASAASE WURA	**ASAASE WURA**
Cocoa/Cacao:	Kookoo/Kakao:
Before applying Asaase Wura ™, make sure the area is well cleared. Then also cut all suckers and mesotho trees (crampa tree).	Ansa na wode Asaase Wura ™ bɛgu ho no, hwɛ hu sɛ beaeɛ no woadɔ hɔ yie. Afei nso twa nnuane a ɛfifire bi te sɛ mmɔɔroba ne krampa nnua.
For the best results Yara recommends complimenting Asaase Wura™ with Yara Liva™ Nitrabor ™ 15.4 N-26 CaO-0.3B.	Sɛ wopɛ sɛ wonya no yie pa ara, Yara kamfo sɛ fa YaraLiva™ Nitrabor TM 15.4 N-26 CaO-0.3B pii Asaase Wura ™ no so.
Apply 3 bags/acre (50 kg bag) of Asaase Wura between March and April using broadcast method.	Fa Asaase Wura bag mmiensa (kilogram aduonum) fa ntopete kwan so gu so wɔ Ɔbɛnem ne Oforisuo ntam.
Complement with 1 bag/acre (50 kg bag) of Yara Liva Nitrabor between July and August using broadcast method.	Fa YaraLiva Nitrabor bag baako (kilogram aduonum) fa ntopete kwan so gugu wɔ Kitawonsa ne Ɔsanaa ntam.

5.3. Discussions

This study highlights the importance of translating the labels on agrochemicals into Akan (Twi) for various reasons as outlined by the farmers during my interaction with them on phone. Almost all of them agreed that translation (oral or written) ought to be the only remedy to their predicament given that most farmers are proficient in Twi and not in English which is the official language of the country.

5.3.1. What is the importance of translation as a way of popularizing knowledge among cocoa farmers?

Farmers in the study area can be classified into five groups based on their educational background. The first group are stark illiterates who can neither write nor read, the second group have primary education, the third group are Junior Secondary School leavers, the fourth group have Senior Secondary School education, and the fifth group are University graduates. However, the junior secondary school leavers as well as the secondary school leavers form majority of farmers these days. It is significant to note that this

category of farmers favoured the use of Akan as they are more proficient in Twi. These people favour the use of Twi for several reasons. The first reason for their decision to use Twi is for proper application of farm inputs such as fertilizers, and pesticides. The instructions for the application of farm inputs are written in foreign languages namely English, German, and French, which they cannot read let alone understand. As such, they rely on literate brothers, friends, and agrochemical dealers to tell them exactly the recommended dosages, frequency, and time of application of fertilizers and pesticides on their farms.

The second reason is to reduce dependency on agricultural extension officers, clothed with the responsibility to educate farmers on the use of the farm products. Some interviewees contended that the extension officers do not attend to their needs as they request for transport fares in and out before visiting their farms, which most of them don't have; they are also based in towns and cities, and not easily accessible to them. Above all, they have a cavalier attitude towards farmers' concerns. An agricultural extension officer works directly with farmers and companies related to agriculture. Their primary role is to aid these groups to make better decisions to increase agricultural production. The extension officer is constantly armed with the latest techniques and information related to agriculture and they relay this information to farmers and agricultural business. They also attend seminars and work with other experts in agriculture to learn more or even develop new methods that could advance production. Furthermore, I argue that the local language (Akan) must be central to farmer education and training in Ghana as it is the language most of them can speak and understand.

5.3.2. Is there any connection between the death of cocoa farms and chemical application?

Just as life and death are in the tongue of the court interpreter, much the same way, plants' lives can also depend on translation. The interviews revealed that there is a direct connection between the death of cocoa and chemical application in that when dosage, time and frequency of application are abused, the trees are likely to either wither or die. No farmer interviewed denied this fact. For example, when farmers were asked as whether there was a correlation between the death of trees and misapplication, these were some of the responses:

Farmer A: *if one does misapply the chemical products, it is dangerous to the plants because this can either reduce yields or kill cocoa trees.*

Farmer B: *one of our farmers use 'Dursban (or chlorpyrifos)' to spray his*

cocoa trees and all the farm died.

Farmer C: *At first farmers competed on the application of fertilizers and most farms at Torompan, Awurabo, Nope, Ayensu, Ayensu have all died.*

It is to be noted that 'Dursban' as a chemical product used by farmer B is not approved or recommended by Ghana COCOBOD. It is crystal clear that not being able to read and understand instructions in a foreign language can have deleterious effect on farms: this does not only have repercussions on trees alone but on yields as well. We also learnt that farmers competed among themselves as regards the one who could spray or apply more fertilizers and pesticides on their farms, leading to overdosages, misapplication and overuse in some circumstances. Pesticides are a significant component of the modern agricultural technology that has been widely adopted across the globe to control pests, diseases, weeds and other plant pathogens, in an effort to reduce or eliminate yield losses and maintain high product quality (Denkyirah, et al.). Although pesticides are said to be toxic and exposes farmers to risk due to the hazardous effects of these chemicals, pesticide use among cocoa farmers in Ghana is still high. Furthermore, cocoa farmers do not apply pesticide on their cocoa farms at the recommended frequency of application.

Results of the study revealed that the use of pesticide and fertilizer is still high among farmers in the Region and that cocoa farmers do not follow the Ghana COCOBOD recommended frequency of pesticide application. In addition, cocoa farmers in the study area were found to be using Ghana COCOBOD approved and recommended pesticides/fertilizers as well as COCOBOD unapproved pesticides for cocoa production.

Pesticide application in agriculture within the cocoa industry in Ghana calls for concerns about the safety of residues in cocoa beans, soils and water, as well as other potential harm to humans and the environment (e.g. destruction of natural enemies of pest and the development of pest resistance) (Antle, and Pingali); (Pimentel); (Adeogun, and Agbongiarhuoyi); (Adejumo; Adejumo, et al.); In most developing countries like Ghana, these consequences have often been severe because farmers do not use approved pesticides, and do not follow recommended frequencies of pesticide application by government agencies for crops. They however misuse, overuse and apply pesticides and fertilizers indiscriminately (Konradsen); (Sam, et al.), with disregard to safety measures and regulations on chemical use.

5.3.3. Is translating labels on agrochemicals into Twi a panacea to solving farmers' linguistic barrier?

Atu posits that pesticides are poisonous and can have deleterious effects on human health. Pesticide exposure accounts for 3 million acute poisoning cases

annually (WHO/UNEP 1990) and responsible for the death of about 20,000 farm workers every year, especially in developing countries. Results of the study indicated that translation, whether oral or written, must be a panacea for solving misapplication to some extent because not being able to read and understand the language of instruction was identified as one of the causes of misapplication of inputs. When farmers were asked as whether translation could be a remedy to their problems, the response below was the answer: '*not knowing the language presents a great danger. Going forward, government should use Twi side by side with English for easy understanding of instructions about dosage, and application methods'* (Farmer D). Translation into the local language (s) ought to be considered as one of the means to solve the misuse, overuse and indiscriminate application of fertilizers and pesticides. Literacy rate in the country is now at 69.8 per cent, a report of the 2021 Population and Housing Census conducted by the Ghana Statistical Service has indicated. For the message on labels to achieve all its communication objectives with his target audience, the translator must first identify his motivations and the relevant elements of the reception context (socio-culture, language, etc.). By ignoring some of these prerequisites, the translation risks missing its target. In addition, for intelligent message distribution, the choice of space, language and channels must necessarily obey an essential criterion: accessibility by the target audience. This accessibility includes the ability to access the message via the channel used, and the ability to understand the language used.

With the advent of technology, instructions regarding the application of chemical inputs can be stored in USB flash drives for every agrochemical product on sale. Nowadays, many farmers possess radios with Bluetooth function, which enable them to listen to audio-recordings. In this regard, the farmer, who cannot read nor write Akan (Twi), can listen to the recordings a few minutes prior to using the pesticides, fertilizers, or any other chemical on their farms. However, this is an uphill task in that some people argue that the local languages still lack the capacity for technical translation. This is because most technical and scientific words may not have a direct equivalence in African languages as these languages do not engage such technical and scientific sectors. It is worth noting that translation is not word-based but sense-based and it matters little the route that leads the translator to arrive at meaning. Jakobson (235) contends that "all cognitive experience and its classification is conveyable in any existing language. Wherever there is deficiency, terminology may be qualified and amplified by loan words, or loan translations, neologisms, or semantic shifts and finally by circumlocutions". He further submitted again that "languages differ essentially in what they must convey and not in what they may convey' (Jakobson 236).

The result on education shows that literacy level in the study area is high, although very few farmers had tertiary education. This also means that farming is no longer the preserve of illiterate people as more young people with secondary school education have taken to farming. The interviewees indicated that they depended on chemicals to control pests and diseases. Nevertheless, the chemicals are of two kinds: COCOBOD approved and recommended pesticides and fertilizers and those that are unapproved by Ghana COCOBOD. The use of unapproved pesticides and fertilizers in farms is because the approved inputs are free and cannot easily be accessed in the markets.

The only way a farmer can access Ghana COCOBOD approved and recommended pesticides is through government free cocoa mass spraying exercise, which some farmers believe has been politicized. Interestingly, some beneficiaries of the mass spraying exercise alleged that open market chemicals are more efficacious than COCOBOD chemicals and fertilizers. In the study area, some COCOBOD approved and recommended pesticides and fertilizers were Confidor, Akatemaster, Nordox, Kocide, Actara, Champion, Funguran, Metalm, Ridomil, and Asasewura, cocoa Aduane, cocoa Nti, cocoa feed respectively. The language barrier, according to some farmers, explained why they did not adhere to the recommended dosage, time and frequency of application. Cocoa farmers did not follow the recommended frequency of pesticide application in that the only language of instruction on these labels is English.

Recommendations

The use of unapproved pesticides is caused by the unaffordability and unavailability of these pesticides in agrochemical shops. I therefore recommend the Ghana COCOBOD to make them readily available and affordable to farmers in all agrochemical shops throughout the study areas. One of the key issues raised by farmers is the immediate access to extension officers. I suggest that COCOBOD extension officers should work hand in hand with farmers to provide them with the necessary information on alternative pest control mechanisms to reduce the abuse of chemical application on cocoa farms. Given that farmers use of pesticides and fertilizers and frequency of application were influenced by agrochemical dealers, fellow farmers, presence of insect pests, disease, and routine (calendar) application other than extension service, the research study endorses the intensification of extension education to cocoa farmers in the study area on pesticide use practices to avoid misuse and the risk factors associated with indiscriminate use of pesticide. Further, the government's policies dubbed 'cocoa mass spraying' exercise, which seek to promote the use of pesticides among farmers,

must be intensified to involve all farmers. Extension officers are also encouraged to help farmers form farmer- based cooperatives to give them a bigger voice so that training on agrochemical use can be intensified. Finally, considering the low level of education among farmers, I suggest that the former policy of government's adult education policy should be revisited to help farmers to be able to read and write in their own mother tongue. Regarding the instructions on agrochemical labels, it is recommended to have them translated orally and stored in pen drives for those farmers who may need them. As a result, the government needs to empower the Ghana Bureau of Languages to translate all government approved agrochemicals into the major Ghanaian languages: Twi, Ewe, Ga, Dagbani, Dagaari, Gonja, Hausa, Nzema.

Conclusion

Most farmers used both approved and recommended pesticides and fertilizers in their farms to control pests and diseases and increase yields. The farmer's decision to use pesticides and fertilizers depends on their availability in agrochemical shops, income, etc. nevertheless, one cannot rule out that the recommended dosage, frequency, and time of application can partly be attributed to a language barrier as majority of farmers are only literate in Akan (Twi). Hence, it is necessary to translate all cocoa related labels into Akan (Twi). It is the only panacea to democratize knowledge in the agriculture sector among cocoa farmers. The educational level of a farmer is strategically significant to help reduce misuse, overdosage and misapplication of fertilizers and pesticides. There is no doubt that language has a negative relationship with frequency, time, and dosage of pesticide application. The study focuses, as stated early on, on the Western Region, hence its limitation. This study is not conclusive in that further investigations could be extended to other cocoa growing regions such as the Asante and Bono Regions.

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