Ecolinguistics and Systemic Functional Linguistics (SFL): Transitivity in ' Climate Change in Egypt' by Ali Masria

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ABSTRACT

Keywords:

Ecolinguistics, ecology, sfl, E E, transitivity, process, participant, circumstance, goal and actor.

This paper presents Ecolinguistics as a relatively new branch of linguistics concerned with the interaction between human being and nature; how they influence each other. It handles systemic functional linguistics, usually referred to as (SFL) presented by M K Halliday, a new approach to grammar and to Ecolinguistics as well. Transitivity, as an important aspect of SFL, is applied to an article about climate change in Egypt. The six processes, participants and circumstances are analyzed as important parts of transitivity in this article.

Introduction:

Human beings live in a constantly-changing world that gradually makes them aware of the environment and the negative influence they have on it (Al Thekrallah, 2019, p.6).Due to human abuse of nature since thousands of years, human beings face many ecological crises that need to be resolved, hence, the dire need of such science to raise human's awareness of these crises and available solutions. Dash states that Ecolinguistics fulfills the need of a linguistics that can protect ecology through language and

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language through ecological sustainability by 'harnessing, developing, and promoting both language and ecology' (Dash, 2019, p.381).Emmanuel A. Adedun adds that the issue of environment and its preservation and cultivation is as old as man himself (Adedun, p .2).

Aim of Study:

This paper aims to present ecolinguistics, a relatively new branch of linguistics, with its different definitions, different approaches, and contributors to it, its scope domain and its importance. The study also deals with SFL, as an important approach to ecolinguistics with concentration on transitivity, an essential part of SFL. The researcher tries to prove the applicability of SFL. The researcher hopes to draw the attention of other researchers to the inclusion of Environmental awareness in schools' and universities' textbooks.

Ecolinguistics:

According to Yina Wu, ecology has become' the core issue of the 21st century, and Ecolinguistics, the interdiscipline of ecology and linguistics, therefore has become the focus of study' (Wu, 2018, p.1). Dash supports this view by stating that Ecolinguistics is very essential in the twenty-first century 'as the globe faces an alarming crisis which threatens the existence of human species on Earth' (2019.1). He goes on to say that 'the only remedy to these global crises is connecting nature and people '(Dash, 2019, p. 2). Furthermore, Dash tries to prove that ecolinguistics is the science of the twenty first century. Einar Haugen, in 1972, was the first one to highlight the need for ecological study of language and linguistic study of ecology (Dash, 2019, p. 380).His ecological perspectives paved the way for the birth of Ecolinguistics in 199os.He was the first one to come up with the definition of language ecology in 1972' i.e., the study of the interactions between any given language and its environment. In 'The Ecology of Language', he opens the door to the interaction between any language and its environment. He assured that language is part of a larger environment:

language is part of a larger ecology of individual-society-social forces-natural environment, all of them mutually interact and shape one another at multiple scales (Le Vasseur, 2014, p.2). According to him, Language exists only in the minds of its users, and it only functions in relating these users to one another and to nature' (Wu, 2018, p.2).Social and natural environment should be included.

It is noteworthy that there are many different definitions of the term 'ecolinguistics'.According to Todd Le Vasseur, ecolinguistics is an emerging field of study. From its very beginning in the early 1990s, it has meant different things to different scholars (Le Vasseur, 2014, p. 1).For some scholars, ecolinguistics means the interaction between human discourses and natural world. Some scholars treat it as the study of the ecology of language, while others handle it as a declining linguistic diversity. Todd Le Vasseur emphasizes the need to the existence of a consensus working definition of the term ecolinguistics, a unified methodology, and an approach to analyze language and environment interactions. We will present different definitions of the term and different approaches to ecolinguistics.

The term ecolinguistics is auto-suggestive. It combines 'ecology' and 'linguistics'. It is a branch of linguistics that studies ecology. The prefix 'eco' stands for ecology or ecological, and linguistics means the scientific study of language or a linguistic study of ecology or both. According to Yina Wu (2018, p.1), two disciplines appear to be unconnected from the first look. Many terms have resulted from the combination of the two terms: 'ecology' and 'language' e.g., ecocide, linguicide, biodiversity, linguistic diversity (Dash, 2019, p.379).Other terms related to ecolinguistics are ecology, ecology of language, language ecology and ecosophy.

Defining ecology is very helpful to the field of ecolinguistics: 'ecology is the study of the relationship between living organism, including humans and their physical environment; it seeks to understand the vital connection between plants and animals, and the world around them' (Dash, 2019, p.

380).In this sense, ecolinguistics investigates the harmony (or lack of) between humans, nature, language and culture. It studies language ecology and analyzes texts which are about environmental or ecological issues.

Arran Stibbe is one of the greatest pioneers and shapers of ecolinguistics. He is the convener of the Language and Ecology Forum. He defines ecolinguistics as the description of 'the studies of language interaction and diversity, studies of sign posts…analysis of texts which happen to be about the environment' (Todd Le Vasseur,2014,p.1).So, the field of ecolinguistics includes ecological perspectives and ensuring environmental sustainability (Dash, 2019,p.381).In this sense, ecolinguistics has two aims, namely, firstly, to develop linguistic theories which see humans not only as part of society, but as part of larger ecosystems that life depends on. Secondly, linguistics can be used as a key address to ecological issues from climate change and biodiversity to environmental justice (Dash, 2019, p.382).It studies the link between language and ecology, and fosters the growth of ecology and language.

Arran Stibbe states that language has a crucial part in humans' link to each other, to other organisms, and to the environment. Language can influence the way human beings think about the world, or rather it inspires humans to protect or destroy the ecosystem that their life depends upon (Stibbe, 2012, p.418).

Stibbe argues that ecolinguistics 'questions the stories that lead to ecological destruction and undermine linguistic diversity and offer positive alternate stories that we live by'. It differs from other branches of linguistics, as it focusses on the ecological context, language ecology and sustainable development for a green earth and healthy coexistence of all beings. It analyzes linguistic texts or discourses from ecological perspectives, sources, and resources including commercials or advertising, (un)sustainable development, climate change, ecological conversation, ecosystems, and environmental issues. It is a kind of interdisciplinary critical

discourse analysis. It is the linguistics of the 21ˢᵗ century. It provides framework, tools and techniques that no other linguistics has ever offered (Stibbe, 2014, p.118).

Linguistics, in general, provides tools, methods and techniques to study texts, events, contexts or phenomena from a specific approach or perspectives. This means that ecolinguistics tries to present tools and approaches to study ecolinguistic topics.

Alwin Fill defines it as a relatively new branch of linguistics which 'investigates the role of language in the development and possible solutions of ecological and environmental problems' (Dash, 2019, p. 381).This means that ecolinguistics analyzes environmental discourses from a critical point of view. According to Fill, it studies the choice of vocabulary, the ways the ideas are presented, and the way the ideas affect environment. In addition, language can lead to desertification of forests or afforestation of deserts, killing or saving of animals, birds, or species. Fill emphasizes that ecolinguistics 'investigates the role of language in the development and possible solution of ecological and environmental problems' (Dash, 2019, p.4).

Ecolinguistics has a strong belief that people's approach to language, culture and environment is formed by the stories they live, and that language helps to tell and retell these stories.

Ecolinguistics supports sustainability efforts and denounces moves that lead to climate change, endangerment of languages, disappearance of species and culture, global warming, biodiversity loss, language loss, growth, and death of environment. It studies the influence of language on the sustainable relationships between human themselves, human and other organisms including natural environment (Zuo, 2019, p.849). In this sense, it combines ecology and linguistics.

According to Stibbe, ecolinguistics provides dimensions for studies of language and globalization, because it encompasses the globe .He argues that the emergency of ecolinguistics at this point of history is the result of advances in human ecology, where interconnections among all kinds of systems (including economic systems, cultural, religious, linguistic, social, and ecosystems) are highlighted and explored (Stibbe, 2012, p.420).

British ecolinguists Alexander and Stibbe give a detailed definition of ecolinguistics, i.e., 'is the study of the influence of language on the life-support relationship between human beings, other organisms and the physical environment. In other words, ecolinguistics focusses on how language forms, maintains, influences or destroys the relationship between human beings, other forms of life and the environment' (Zuo,2019,p.850).

Stibbe divides ecological discourse analysis into three categories: beneficial discourse, such as nature poetry, ambivalent discourse, and destructive discourse. This analysis depends on ecolinguistics. This means that ecolinguistics is much more than the study of language ecology or the analysis of texts that happen to be about environment or ecological issues. According to Yina Wu, it should include analysis of all discourses within an ecological framework, and it should be an ecological analysis of all discourses (Wu, 2018, p.1).

As an applied linguistics, ecolinguistics develops theories that explore the interrelationship between language and ecology and that involve humans. Ecolinguistics encompasses a range of issues such as climate change, destruction or conservation of ecosystems, new practices at curbing language death, cultural or environmental degradation. It provides the necessary tools to study the life-enhancing role of language through ecology. In this sense, ecolinguistics can be considered as a type of critical discourse analysis with ever evolving new frameworks to critique or interpret texts/discourses. This new branch of linguistics has fulfilled the long-felt need for a discipline that

can study the vital role of linguistics to affect or safeguard the ecology and ensure environmental justice (Dash, 2019, p. 383).

Literature Review:

The term ecolinguistics has been applied to a number of different approaches and interests. It is used to describe studies of the blend of languages in multicultural schools , studies of language diversity and interaction, studies of some languages or dialects that are going to be extinct, studies of discourses like outdoor signposts, analysis of texts about environment or related to environment such as animals, natural resources, advertising, energy, ecotourism or climate change. Stibbe accounts for this diversity of approaches by relating them to different understanding of the term and concept of 'ecology'. He maintains that linguistics of ecolinguistics is simply 'the use of techniques of linguistic analysis to reveal the stories-we-live-by, opening them to question and challenge from an ecological perspective'(Wu, 2018, p.2).

According to Steffensen and Fill, Peter Muhlhausler is a key thinker in developing what Fill et al call the eco-critical approach in ecolinguistics. This approach links the ecology of language with a critique of the linguistic practices that lead to degradation of natural environment (Steffensen and Fill, 2014, p.10).

We need linguistics to address the major concerns of 21st century, a discipline that can study and explore the role played by language in 'exposing unsustainability and promoting sustainable discourses. Ecolinguistics is the best genre of linguistics to achieve this' (Steffensen and Fill, 2014, p.3).Sune Verk Steffensen and Alwin Fill state that 'linguistics also needs a sign of the powers that bring language to life-and life to language' (Steffensen and Fill, 2014, p.7).

Chen states that there are three interrelated and distinctive strains to ecolinguistics: Haugenian tradition, biolinguistic tradition and the Halliday tradition (which refers to studies that follow the work of Halliday).The first

approach deals with language as a part of larger ecology and based upon mutual interactions among human mind, natural environment and society. The second tradition (biolinguistic) is perhaps the most popular one. It takes a more practical interpretation of the terms 'language' and 'ecology'. They view that the existing multilingual system across the world is considered as an ecological system, and the extinction of minority languages resembles the loss of biodiversity in the world. It has been adopted by scholars working in the fields of language planning and an anthropological linguistics. The third tradition, Halliday's approach is a functional one; it focusses on language and environmental degradation (Le Vasseur, 2014   , p.110).

Chen argues that 'ecolinguistics' and 'language ecology' are best to be treated as umbrella terms describing a highly interdisciplinary field. Moreover, he states that topics of ecolinguistics overlap with other subfields of linguistics such as critical discourse analysis, language sciences, discourse and communication, and sociolinguistics. Ecolinguistics has received growing research attention within linguistics, and this can be easily noted from its increasing publications in scholarly journals, different and diverging research topics and mixture of various research methods. He concludes that these indicators present a positive prospect of the future of ecolinguistics (Chen, 2016, p.112).

Nadege, Lechevrel (2009) states that he uses the term 'ecolinguistics' as a window to the world 'of many approaches ,but the term 'ecology of language ' covers a broad range of interests within which linguists can cooperate significantly with all kinds of social sciences to have an understanding of the interaction of languages and their uses as Haugen explains' (p.4). He is of opinion that terms like 'ecological linguistics' or 'ecolinguistics' do not refer to a single well-defined theoretical model but rather to a vast body of research and propositions which share a main line. These trends have gathered together under two or three umbrella terms which are linked to each other by loose connections that enable them to form a set of theoretical frameworks. He underlines fortuitous combinations of

words in the adjective ECOLOGICAL which stands for: evolution, cognition, ontology, language (s), observation, groups, individuals, Culture, anthropology, and linguistics. This combination is to integrate an ecological approach and everything needed to carry out an empirical and theoretical inquiry on language (p.9).Moreover, this adjective is very easy to be remembered by any one.

The famous linguist M K Halliday's paper 'New Ways of Meaning: the Challenge to Applied Linguistics' in 1990 is considered to be a critical turn for ecolinguistics. He contributed to the emergence of ecolinguistics by posing some questions: 'Do linguistic patterns, literally affect the survival and well-being of the human species as well as other species on Earth?' It is worth-mentioning that Halliday is the first one to link biological ecology, economic and environmental problems and language in a paper he presented at the World Conference of Applied Linguistics. His first paper was followed by another one that was published in two important ecolinguistics publications: Martin Dutz's (Ed., 1992) Thirty Years of Linguistic Evolution: Studies in Honour of Rene Driven, and Alwin Fill and Peter Muhlhauler's (Ed., 2001), The Ecolinguistics Reader: Language, Ecology and Environment. Halliday considers not only the physical/ natural/social environment but the mind as well. To him 'language is at the same time a part of reality, a shaper of reality and a metaphor for reality'(cited in Adedun,p.4) .He notices that the resources of earth are not finite and can be surely exhausted by human beings. This is the most linguistic aspect of Halliday's ecology of language, where he draws on concepts from his systemic functional language (SFL).He concludes from his dialectical view of language and society that the dominant mode of production in society has an inevitable effect on the lexicogrammatical choice (Adedun,p.6).

The United Nations Conference on Human Environment held in Stockholm in June 1972, in its 19th principle, declared that States and Nations should insert environmental issues in education to develop necessary bases of young and adult generations towards the protection and

improvement of the environment. An international symposium, held in Belgrade in 1975, discussed the complex and ever-changing relations between humans and nature and assumed that (EE) Environmental Education might solve the environmental problems and suggest new solutions to avoid their appearance. In 1977, intergovernmental Conference of Tbilisi concluded that E E is very important as global and permanent solutions to environmental issues (Mliless and Larouz, 2018, p. 105). These conferences and symposiums among others, emphasize the importance of ecolinguistics and E E as part of it.

The work of 'Hallidayan tradition', the scholars who built on Halliday's perspectives, aims to 'create an awareness of linguistic anthropocentrism' (Le Vasseur,2014,p. 3) that marks human relationship with other species and that it allows human to view themselves as the Centre of the universe and they can direct the fate of other species (Adedun, p.4).

Xinya Zuo states that Halliday presents language as an essential part of society and the whole living system. Halliday emphasizes the role and influence of language in environmental protection and degradation. He goes further by adding that human beings recognize the world and interpret experience through language .The behavior and words of human beings are determined by their relationship among themselves and to other humans and species in the ecosystem and finally their relationship to nature (Huang &Zhao, 2017,p.586) in (Zuo, 2019,p.851).

Systemic Functional Linguistics (SFL):

Halliday states that there are three main metafunctions of language: the ideational, the textual, and the interpersonal. The ideational function is the use of language to express content and to communicate information. This function involves two systems: transitivity and ergativity. In the textual function, language becomes discourse or text which, in turn, is expected to be related to itself and to its context of use (the preceding and following text) and the context of situation. Textual function can be divided into two types:

thematic structure (theme and rheme) and information structure (given and new). Interpersonal function is used to establish and maintain social relations. This function involves modality: mood and residue (Bustam, 2011,p.22).

Three Meta- functions of language

Halliday &Matthiessen's (2014) three Meta-functions of Language

Meta-function	Definition	Corresponding Status in a clause
Experiential	Introducing human experience	Clause as representation
Interpersonal	Enactment of personal and social relationship	Clause as exchange
Textual	Arranging the discursive flow	Clause as message

Almurashi argues that there are many theories that study aspects of language. One of the most important theories is Halliday's Systemic Functional Linguistics (SFL). Transformational generative grammar (presented by Noam Chomsky) and structural linguistics (introduced by Bloomfield) are well-known among other theories (Almurashi, 2016, p.1).SFL has attracted the attention of most scholars and has been frequently employed in different fields (Almurashi, 2016, p. 2).

Systemic Functional Linguistics (SFL) is a linguistic approach to language developed largely by Halliday and his followers during 1960s.It has depended on the works of some famous linguists like Malinowski and J.R.Firth.It is an approach used world widely, especially in language education and other fields like discourse analysis (Almurashi,2016,p.2).As an approach, it is mainly concerned with the use of language, so, it pays much attention to the function of language.SFG, systemic functional grammar, studies language through meaning(function),while transformational generative grammar(TGG) concentrates on form. Language is a means of expressing and transferring ideas or experiences among people. Halliday (1985) states that a language is interpreted as a system of meanings,

accompanied by form through which meanings can be realized and answers the question 'how are these meanings expressed?'(Ong'onda, 2016, p.77). Linguists who adopt this approach are interested in relating the various kinds of linguistic structures and patterns to the functions that language serves and to the social settings, in which it is used (Zuo, 2019,p.852) .According to SFL, the use of language is the result of choice and the choice is driven by meaning. The reason why a particular text experiences a particular meaning is the result of the choice of the speaker or writer.

Van Dijk observes that systemic functional grammar (SFG) is an approach to understand written texts. It is used in creating meaning, not just from the grammatical rules, but in the meanings that emerge from the choice of words used to describe the action, the person speaking, or the object and person being spoken of (Ong'onda, 2016, p.79).It is well-known for its application in different fields such as health care, computational linguistics, translation, literary texts, media discourse, critical discourse analysis and history. According to Mathiessen, scholars are still discovering new areas of application. He adds that it is applicable in unlimited fields. Almurashi adds that 'it is considered a chief force in world of linguistics' and 'it is an influential tradition in linguistic studies (Almurashi, 2016,p. 6). It reflects the trend in linguistics development. It provides an innovative value from functionalism and a useful tool for those who wish to analyze texts (Almurashi, 2016, p. 7).Halliday and Mathiessen state that SFL is designed to be applied to solve problems that arise around the world.

SFL focusses on meaning-making. It is a theory and a framework of analysis. Cheryl Cordeiro (2018) states that SFL has developed rapidly during the 1990s and early 2000s as grammar for the purposes of text analysis, 'one that would make it possible to say sensible and useful things about text, spoken or written in modern English (p.4). Again, he quotes Halliday 'a discourse analysis that is not based on grammar is not an analysis at all, but simply a running commentary on a text (Cordeiro, 2018, p.4).According to Eggins, SFL is a metalanguage that enables the study of

language as a system of systems (Cordeiro, 2018, p.5).It can be defined as a meta-linguistic theory and framework for describing and analyzing languages.

Montes et al (2014) emphasize that SFL is mainly concerned with how people use language to construct and interpret meaning. It is impossible to achieve a communicative purpose of language if words are not suited in a specific context. In this sense, language is seen as a social means to help people to convey meaning. So, context or situation in which clauses and words can be placed is very important in meaning-making (p.105).This justifies why SFL studies language in context in terms of field, tenor and mode. Field refers to the subject matter of the topic in any situation. It answers the questions such as what is going on in the text. And what are people doing? Examples of field are activities like linguistics and opera. In contrast, tenor represents relationships of main characters and roles of people in social status. It studies people positions in the world in terms of knowledge, age and profession. Mode is concerned with the idea of channel of communication. Mode of discourse can be written or spoken. Recently, there are a variety of channels like Facebook, blogs, Skype, e-mail, telephone and films (p.115).According to Halliday and Hasan, mode of discourse refers also to what part language is playing (p.116).Montes et al conclude that DA and SFL can be seen as very good and useful tools for the study and analysis of texts and articles.

Halliday explains that language is set as meanings rather than a combination of words and sentences. SFL is concerned with how language is used in social contexts to achieve particular purposes. This approach relates grammatical structures with meaning. It explains that the grammatical choices are available to the language users from which they are free to select whatever they like in the context they are in. In other words, it explores meanings. Grammar and vocabulary are viewed as distinctive features of language. In this sense, SFG is a mixture of grammatical and meaning description, so, it is part of SFL as a social semiotic approach (Al Thekrallah

, 2019, p.36). SFL identifies how meanings are generated and exchanged through grammar resources and lexis. Language is a set of systems which presents its users infinite choices of generating meanings. It is worth-mentioning that there are many linguists who have contributed to the development of SFL, namely; Robert Martin (1950), Ruqaiya Hasan (1977), Eggins (1994), Fontaine (2014), Thompson (1996, 2004, 2014), Bloor and Bloor (2004, 2013) (p.36).

Within the framework of SFL, the unit of analysis is a clause rather than the sentence. Clause is a grammatical structure that contains a finite verb (verb that has tense) and not that structure that contains nonfinite verb like infinitives and gerunds (to go, going to).

Halliday (in his introduction to systemic functional grammar SFG) develops an old conception of transitivity, but it differs from it in one thing, namely whether the verb takes (or does not) a direct object is not important (Bustam, 2011, p.22).In the ideational function, language represents the patterns of human's experience of the world, and it enables them to form a mental picture of reality to make sense of their experience of what goes around them and inside them as well. This reflexive experiential aspect of meaning is called transitivity (Hu& Jiang.2000) cited in (Song, 2013, p. 2291). Transitivity, in Hallidayan terms, is part of the ideational function of the clause. The ideational function represents processes or experiences: action, events, processes of consciousness and relations. Transitivity is a grammatical system which handles different types of processes that can be found in the language and the structures. It construes the world of experience into a manageable set of processes (Zuo, 2019, p.851).

Transitivity has three components: process, participants and circumstances. It (transitivity) focusses on the clause, and within the clause it focusses on the process. The verb in the clause is the process itself, as it determines the class of the process type and information about the activity or event that the subject does (Afrianto, Lia Maulia et al.,2014,p.79).This

means that the process is the core content of any clause. Bloor and Bloor (2004) have argued that process is the central part in a clause which is linguistically expressed by verb or verbal group while participant is expressed with noun phrase or noun group, and circumstance is expressed with adverbial, adverb, adverbial group and prepositional phrases.

There are three components of what Halliday calls transitivity process:

Type of element	Typically realized by
Process	Referred by Verbal group
Participant	Referred by Nominal group
Circumstance	Adverbial group or prepositional phrase

Halliday &Matthiessen's (2014) Group and Phrases of Experiential Functions

Firstly, the process itself: is the kind of event or state that is being described.Secondly,participants in the process are the entities that are involved in the process such as actor, goal, sayer, sensor, behavor,identifier, value and token. Each process has a number of participants that is to be attained through nominal groups and pronouns. Thirdly, circumstances are related to the process-specifying when, how, where and why it happens (Ong'onda, .2016, p.79).circumstances are achieved through adverbial and prepositional phrases.

There are six process types: material, mental, relational, behavioral, existential, and verbal. Here is the table of the processes presented by Halliday (1994, p.143).

Process Type	Category Meaning	Participants
Material Action Event	Doing, happening, Kick, run, repair, send	Actor Goal
Behavioral	Behaving	Behaver
Mental Perception Affection Cognition	Sensing, seeing, feeling, Thinking, See, hear, know	Sensor, Phenomenon
Verbal	Saying, say, tell, Warn, argue, ask	Sayer Target
Relational	Being, attributing, identifying, Be , have ,become	Carrier, value, token, Identified, identifier, Attribute
Existential	Existing	Existence

In traditional grammar, processes are verbs of the sentences, while participants are subjects and objects and circumstances are modifiers of the verb or the sentences.

The six processes are as follows:

1-**Material Process**: the process of doing. Within the clause, it is the representation of the experience of events and actions (Halliday &Matthiessen, 2014).It includes two participants: an Actor and often a Goal. Actor means the one that does the action or the deed, the Goal is the directed action or the participant that is influenced by the process. For example:

The officer arrested the thief. The officer is the Actor, arrested, and the process itself, and the thief is the Goal.

It is worth-mentioning that in some cases the Actor can be omitted in passive voice. In this case, the agent/ actor becomes less prominent and the person or thing affected by the action is the focus.

2-**Mental Process**: the process of sensing, it refers to verbs that indicate perception, cognition, affection and desire. It enables language users to express their opinions, thoughts, and tastes. According to Halliday&Matthiessen (2014)

, it represents the internal experience. It includes two participants: Sensor, the one that is feeling, thinking or seeing and phenomenon, what is sensed or thought or felt or seen. This process helps humans to identify their concept of reality. It tends to be realized through the use of verbs like feel, think, know, smell, see, want, like, hate, admire, please, repel, enjoy and fear (Ong'onda,2016,p. 83). For example: she loves flowers, she is Sensor, loves is the cognition process, and flowers the phenomenon.

Mental Process Type	Examples
Perceptive	Perceive, sense
Cognitive	Think,believe,expect
Desiderative	Wish, like, hope
Emotive	Fancy, love, hate

Halliday &Matthiessen's (2014) Mental Processes Classification

3-**Verbal Process**: the process of saying, it involves communication between two participants: a Sayer, and a receiver or addressee, and the content or the message, the verbiage, is conveyed. This verbal process refers to activities related to information that includes saying, asking, commanding and offering. Another type of verbal process is that in which the sayer acts verbally on another direct participant by using verbs like: insult, praise, abuse, slender and flatter. The other participant is referred to as Target, the entity to which the utterance is said (Bustam, 2011, p.25). For example, they asked him a lot of questions: they is the Sayer, asked, the verbal process, him, the receiver, and a lot of questions is the verbiage. But in a clause like:

I'm always praising you to my mother: you is the target and to my mother is the receiver.

4-**Relational Process**: the process of being, it characterizes or identifies. There are certain verbs included in this process e.g., verb to be and other verbs related to it like seem, appear, look, become and verbs of possession like have, own, and possess. It has two subtypes: attributive and identifying. The participants in these subtypes differ from each other. The case or situation in the attributive process is description; it does not identify. According to Bloor and Bloor (2004), it attributes something to some entity. Attributive process has two participants: Carrier and Attribute. When the process shows possession or ownership, the participants will be possessor and possessed.

Halliday and Matthiessen (2014) add that the second function of relational process of identification is accomplished by identifying or showing something via something else: two participants are included: Token and Value. They are used with the aim of identifying the other. For example: My friend is Jack: my friend is token, while Jack is Value.

5-**Behavioral Process**:   it is the process of physiological and psychological behavior such as breathe, laugh, dream, cough, smile, and cry (Song, 2013,p.2292).This process stands between material and mental processes. It is difficult to distinguish behavioral process verbs from material and mental process verbs as well. This process has verbs like have and be. But to make it easy, in behavioral process, the verb is intransitive (it has only a participant) and it indicates an activity in which both physical and mental are inseparable and indispensable to it (Bustam, 2011, p.29). In addition, in this process, there is only one participant, namely the behaver (the agent who behaves).for example:

She neither eats nor drinks. She is the behaver and (neither eats nor drinks) is the process.

6- **Existential Process**: it means that something exists or happens. This process has verb (to be), or other verbs that express existence. Structurally, it is the simplest process. The subject in this process is there. In other words, this process is usually realized by there-construction ('there' is called sometimes an expletive). The typical used verb is (be).It includes verbs like exist and arise followed by a nominal group function as Existent (a thing that exists in the process). The Existent may be a phenomenon of any kind, and sometimes can be an event. For example:

There was a storm: (was) is a process and (a storm) is an Existent, an event.

There are two other participant functions in the English clause: beneficiary and range. Beneficiary is the one to whom or for whom the process is said to take place. This function appears in the material and verbal processes. For example: The client is the one that services is done for. The one that services is done for is beneficiary. Range is the element that specifies the range or the scope of the process; it may occur in material and verbal processes. For example:

Ray climbed the mountain. Fred played the piano. He made a long speech. The words mountain, the piano, and a long speech are the range in these clauses.

Here is a table summarizing the six processes, participants and circumstances:

Process	Participants	Circumstances
Material Process	Actor-Process-Goal	Extent
Mental Process	Sensor –Process-Phenomenon	Location
Relational Process	Attributive or Identifying Carrier-Process-Attribute	Manner Cause

	Identified-Process-Identifier	Accompaniment
Behavioral Process	Behavior-Process	Matter
		Role
Verbal Process	Sayer-Process-Receiver-verbiage	
Existential Process	Process-Existent	

(Song, 2013, p.2293)

Types of circumstantial Elements:

Type	Categories	Examples
Extent	a) Distant b) Duration	a) He walks for *seven miles*. b) She stayed *for two hours*.
Location	a) Place b) Time	a) We *work in Hong Kong*. b) I get up at *8 o'clock*.
Manner	a) Means b) Quality c) Comparison	a) My mother went *by bus*. b) It was snowing *heavily*. c) It went through my head *like an earthquake*.
Cause	a) Reason b) Purpose c) Behalf	a) For *want of a nail* the shore was lost. b) *For the sake of pen*, I paid ten dollar. c) I'm writing *on behalf* of Aunt Jane.
Accompaniment	a)comitative b)additive	a) Fred came *with Tom*. b) Fred came *instead of* Tom.
Matter		I worry *about her health*.
Role		I'm speaking *as your employer*.

(Bustam, 2011, p.30).

Related to transitivity, the term clause is defined by Halliday as 'the simultaneous realization of ideational, interpersonal and textual meanings' (Halliday, 1985, p.42).In this work, he introduces another definition, though related to the first one, 'a clause is the product of three simultaneous semantic processes. It is at one and the same time a representation of experience (ideational), an interactive exchange (interpersonal), and a message (textual)' (Halliday,1985,p.53).He adds that transitivity is the grammar of the clause as a structural unit for expressing a particular range of ideational meanings. In other words, clause can be best analyzed by transitivity. At the same time, transitivity can make a clause understandable mainly by identification of the process in the clause (Bustam, 2011, p.25). Transitivity system can analyze clauses effectively by helping users to recognize and encode their experiences of the world. Halliday argues that the clause functions as the representation of the processes, and it is the most significant grammatical unit, as it enables language users to build a 'mental picture of reality and 'to make sense of their experience of what goes around them and inside them' (Halliday, 1985,p.101).

Analysis:

Climate Change at Egypt by Ali Masria, Mansoura University, Faculty of Engineering- irrigation and Hydraulics, Scifed Journal of Global Warming, 2017 is an article that deals with climate change in Egypt.

The present study applies transitivity as a tool of analysis, due to its importance in identifying the experiential meaning: how it is realized through the processes. So, the main purpose of the analysis is to answer the following questions:

1) How does the writer, through the processes of the (transitivity system), convey the environmental issues in Egypt?
2) How many processes are there in the article (discourse)?
3) What are the most common process types employed by the writer?
4) What are the participants' roles within the processes and the article?

5) Is there any passive voice in the discourse and why?

1)   **Material Processes and Participants in the text:**

There are six material processes in the article. So, there are six actors, namely the economic activity on the continent, almost all of the world, climate change, the recent analysis of current climatic trends that is high temperature, and water sea level. There are four scopes, namely important risks through the predicted sea level, at approximately 3-5mm at the Nile delta, and in recent decades with country temperature increase. Four goals are there in the material processes: carbon emission, warming trend, decreasing water availability, and agriculture lands.

Actor	Material Process	Goal	Beneficiary	Scope
The economic activity on the continent	Has not contributed to		The accumulated stock of carbon	
Almost all of the world	Continues to reduce	The carbon emission		
Climate change	Represents			Important risks through the predicted sea level on the coastal zone
That	Is already subsiding			At approximately 3-5mm year at the Nile delta
The recent analysis of current climatic trends	Reveals	A warming trend		In recent decades with country averaged mean temperature increases of 1.4c and 2.5c

Higher temperature with the semi-arid regions with ensuing evaporative losses coupled with increasing water demands	Will result in	Decreasing water availability from the Nile		
Sea water level	Will negatively affect	Agriculture lands through inundation and salinization		

2) Existential Process:

There are two existential processes. The author states that there is great uncertainty concerning climatic process and significant decline in Nile stream flow. The subject in the two clauses is 'there'.

Subject	Existential Process	Existent
There	Is	Still great uncertainty concerning climatic process
There	Is	A significant decline in Nile stream flow under climate change as a result of the changes in precipitation

3) Mental Process:

There are only three mental processes. Accordingly, there are three sensors and three phenomena: Understanding the efforts of climate change in Africa accompanied the intensive irrigated agriculture upstream .Important socio-economic and political considerations associated are sensors, while great efforts of governmental and research sectors, any reduction in Nile water availability and management policies are the phenomena.

Sensor	Mental Process	Phenomenon
Understanding the efforts of climate change in Africa accompanied	Need	Great efforts of governmental and research sectors
The intensive irrigated agriculture upstream	Would suffer from	Any reduction in Nile water availability
Important socio-economic and political considerations	Demand	Management policies in Egypt

4) Relational Processes:

Generally, relational processes are of three types: possessive, identifying and attributive. These processes are the most common ones in the article. There are almost 12 relational clauses. They fulfill most of types (3) possessive, (4) identifying and (6) attributive. In possessive relational clauses which have verb (to have) as the main verb, the writer talks about the implications of climate change for all of the world, and serious implications for agriculture which result from coastal zone and water resources. There are two possessors, namely climate change and coastal zone and water resources.

In the attributive relational clauses which are six in number, there are six carriers, namely serious cooperation among the Nile Basin countries, climate change scenarios, continued population growth and water use, some things and different industries. Consequently, there are six attributes, namely importance to promote capacity and action in this area, importance to

address the posed issues technically such as data exchange and water allocation, in question, known and relatively understood, affected, and trivial amount compared to global emissions.

Identifying relational processes, there are four identifiers/tokens in the processes and four identified/values: Africa, climate change, the pronoun (it) two times as identifier/tokens and among the highly affected regions, Egypt's agriculture and land-use, adverse impacts on its coastal zones and serious development concern for Egypt as identified/values.

1)   Possessive Relational Processes:

Possessor	Possessive Relational Process	Possessed
Climate change	Has	Implication for all of the world
Coastal zone and water resources impacts	Have	Serious implications for agriculture

2)   Attributive Relational Processes:

Carrier	Relational Attributive Process	Attribute
Political and institutional support	Will be	Important to promote capacity and action in this area
A serious cooperation among the Nile Basin countries	Will be	Of importance to address the posed issues technically such as data exchange, as well as more politically important issues such as water allocation
Under any climate change scenarios, the sustainability with the continued population growth	May be	In question

and water use		
Some things	Are	Known and relatively well understood
Different industries	Will be	Affected
That is considered	To be	Trivial amount compared to global emission

3)   Identifying Relational Processes:

Identifier/token	Identifying Relational Process	Identified/value
Africa	Is	Among the highly affected regions because of high negative effects on the climate change on different sectors like Agriculture
It	Is	Known that Egypt's Agriculture, land-use and population, as well as its economic activity, are constrained at the Nile Delta
It	Is	Extremely vulnerable to any adverse impacts on its coastal zones and water availability from the Nile
Climate change	Is	A serious development concern for Egypt

Results and Discussion:

The author begins his article by talking about the negative and bad effects of climate change on the world in general and Africa and Egypt in particular. It is almost a global phenomenon. But Africa is a highly infected region. Climate change affects different sectors like agriculture, in particular, and different industries in general. He describes climate change as a crisis.

There is an economic activity on the continent but climate change crisis affects this negatively. This crisis in Africa is not due to accumulated stock of carbon emission. Stock of carbon in Africa is trivial, if compared to the global emissions. He adds that all of the world continues to reduce carbon emissions, but Africa has to adapt. He thinks that understanding the negative

effects of climate change needs great efforts of governmental and research sectors. There are some things about climate change that are known and well-understood, but there is great uncertainty about climatic process.

Egypt 's agriculture , land-use, population and economic activity are restricted only to Nile Delta which is extremely vulnerable to any adverse impacts on its coastal zones and water availability from the Nile. A climatic change has important risks for the predicted sea level rise on the coastal zone. There is a warming trend in recent decades which reveals temperature increases of 1.4C and 2.5C.Higher temperature is accompanied by evaporative losses and increasing water demands. This will result in decreasing water availability from the Nile. There is a significant decline in Nile stream flow under climate change, as a result of precipitation. Impacts of the coastal zone and water resources will affect negatively agriculture lands through the overflowing of water. So, climatic change is a serious development concern for Egypt. Moreover, climate change, along with continued population growth, and water use may be in question. As long as the climate change is a crisis, the writer offers solutions:

Firstly, socio-economic and political consideration associated with management policies in Egypt are needed. Secondly, political and institutional support will be important to promote capacity and action in Egypt. These two solutions are related directly to Egypt. Thirdly, a serious cooperation among Nile Basin countries will be of importance to address posed issues technically such as data exchange and water allocation. This solution is related to Africa. He presents climate change as a crisis that needs solutions to avoid its negative effects.

The author uses passive voice many times in his article. In using passive voice, there is an absence of the agency or the actor. According to Mohamed Mliless and Mohammed Larouz (2018), the absence of agency 'obscures meaning in texts' and 'the presence of passive voice in narratives hides individuals' responsibility as perpetrators of destructive actions to the environment' (103).

For example:

Different industries will be affected.

The crisis will be amplified.

A detailed report has been carried out in Egypt to study climate change.

Conclusion:

Ecolinguistics is a relatively new branch of applied linguistics that deals with all types of interactions between human beings and nature. Human's abuses of nature result in many crises. These crises may destroy human's existence and safety. There should be a sort of environmental awareness among people. So, Environment Education (E E) should be included within text books for students.

SFL is an important linguistic approach for many fields including ecolinguistics. Transitivity is an essential aspect of SFL. It is useful and fruitful in its application to any text. It clarifies and penetrates the meaning. It is noteworthy that not all processes have to be existent in the text. The writer may prefer certain processes to others. This is significant in meaning-making in the text.

Climate change is a crisis for the entire world, in general, and Africa and Egypt, in particular. It has enormous negative implications for many sectors especially agriculture and industries.

Climate change, high temperature and population growth are crises that need great efforts on the part of governmental and research sectors. Decrease of water amounts, as a problem, needs cooperation among the Nile Basin nations in terms of water allocations. Again all the environmental crises emphasize the importance of the study of ecolinguistics.

References

Adedun, A Emmanuel. *Ecolinguistics*: *A Critical Discourse Analysis of Selected Nigerian Newspaper Editorial*.

Al Thekrallah, Fajer, Adel (2019). *Ways we Talk about the Environment*: *a Comparative Critical Ecolinguistic Analysis*. *An Unpublished M .A Thesis*, *Faculty of Arts*, *Sohag University*.

Almurashi, Abdulrahman, Wael (2016). *An Introduction to Halliday's Systemic Functional Linguistics*. *Journal for the Study of English Linguistics*/ ISSN.2329-7034. Vol.4. NO.1

http://dx.doi.org/10.5296/jsel. V4i/9423

Bustam, Rayhan, Muhammad (2011). *Analyzing Clause by Halliday's Transitivity System*. Jurnal llmu Sastro vol.6 No.1, Mei . Hal 22-34

Chen, Sibo. (2016) *Language and Ecology*: *a Content Analysis* of *Ecolinguistics as an Emerging Research Field*.(108-116).

www.elsevier.com/locate/amper.

Cordeiro, Marie, Cheryl (2018). *Using Systemic Functional Linguistics as Methods in Identifying Semogenic Strategies in Intercultural Communication*: *a Study of Collocation of 'time' and 'different' by Swedish Managers with International Management Experiences*. *Journal of intercultural Communication Research*

http://doi.org//10.1080//17475759.20180145560/

Dash, Kumar, Rajendra (May 2019) *What is Ecolinguistics*? *Language in India*.www.*language in india*.com. Issn 1930-298 . vol. 19

--- (July 2019). *Ecolinguistics*: *the Linguistics* of *the Twenty-first Century*.

www.Language in india.com ISSN 1930-2940 vol.19

Fill, Alwin and Verk, Sune (2014). *Ecolinguistics*: the State *of the Art and Future Horizons*.

Jounal. Homepage:www.elsevier.com/locate/langsci.

Halliday, M.A.K (1985). *An Introduction to Functional Grammar*. London: Edward Arnold.

Halliday, M. A.K. (1990). *New Ways of Meaning*: *The Challenge to Applied Linguistics*. *Thirty Years of Linguistic Evolution*, 59-95.

Halliday, M. A.K. &Matthiessen C. (2014). *An Introduction to Functional Grammar* (3rd Edition). London and New York: Routledge.

Indray, Lia, Maulia and Afrianto and Seomantri, Soeria Ypsi (2014)*Transitivity Analysis on Shakespeare's Sonnet*.IOSR *Journal of Humanties* and *Social Sciences*. Vol. 19, Issue1, ver.1 .pp78-85.

Lechevrel,Nadege (2009) *The Interwined Histories of Ecolinguistics and Ecological Approaches of Language*(*s*): *Historical and Theoretical Aspects of a Research Paradigm. Symposium on Ecolinguistics*: *the Ecology of Science*, *University of Southern Denmark*,Jun 2009, Odense, Denmark.halshs-00411383

http://halshs.archives-ouvre.fr/halshs-00413983

Le Vasseur, Todd. (2014). *Defining 'Ecolinguistics*? *Challenging Emic Issues in an Evolving Environmental Discipline*/ *Journal of Environmental Studies and Sciences* J Environ Stud Sci.

Doi 10.1007/s13412-o14-0198-4

Masria, A. (2017).*Climate Change at Egypt.Scifed of Global Warming*. Mansoura University, Faculty of Engineering-irrigation and Hydraulics.

Mliless, Mohamed and Larouz, Mohammed (2018) *An Ecolinguistic Analysis of Environment Texts in Moroccan English Language Teaching Textbooks*. *International Journal of Research in Environmental Studies*.

www.bluepenjournals.org/ijres

IJres 5(2018)103-116.ISSN 2059-1977

Montes, Garcia,Paula et al (2014) *Systemic Functional Linguistics and Discourse Analysis as Alternatives when Dealing Texts*. Profile Vol.16, No.2, October, ISSN 1657-0790, Bogota, Colombia Pages 101-116.

Ong'onda, Anashia Nancy (2016). *Transitivity Analysis of Newspaper Headlines on Terrorism Attack in Kenya*: *A Case Study of Westgate Mall*, Nairobi. *International Journal of Humanities and* Social *Science* Vol.6 No.9. Sept 2016

Song, Zijiano (2013). *Transitivity Analysis* of *A Rose for Emily*. *Theory and Practice in Language Studies*. Academy Publisher. Vol.3. No. 12.pp2291-2295

Stibbe, A. (2012). *Ecolinguistics and Globalization* .In: *The Handbook of Language and Globalization*, John Wiley &Sons, 413-420.

http:// eu.wiley.com/Wiley CDA/Wiley Title/product cd-11834717x.html

Stibbe, A. (2014). An Eco-linguistic Approach to Critical Discourse Studies. Critical Discourse Studies, 11 (1), 117-128.

Wu, Yina (2018) *Ecological Discourse Analysis*. *Advances in Social Science*, *Education and Humanities Research* (ASSEHR), vol.181 4th *International Conference on Social Science and Higher Education* (ICSDSHE).

Zuo, Xinya (2019) *An Ecological Analysis of Emily Dickinson's 'The Grass'. Theory and Practice Language Studies*. Vol. 7, pp. 849-853

http:// dx.doi.org/10.17507/tpls. 0907.15