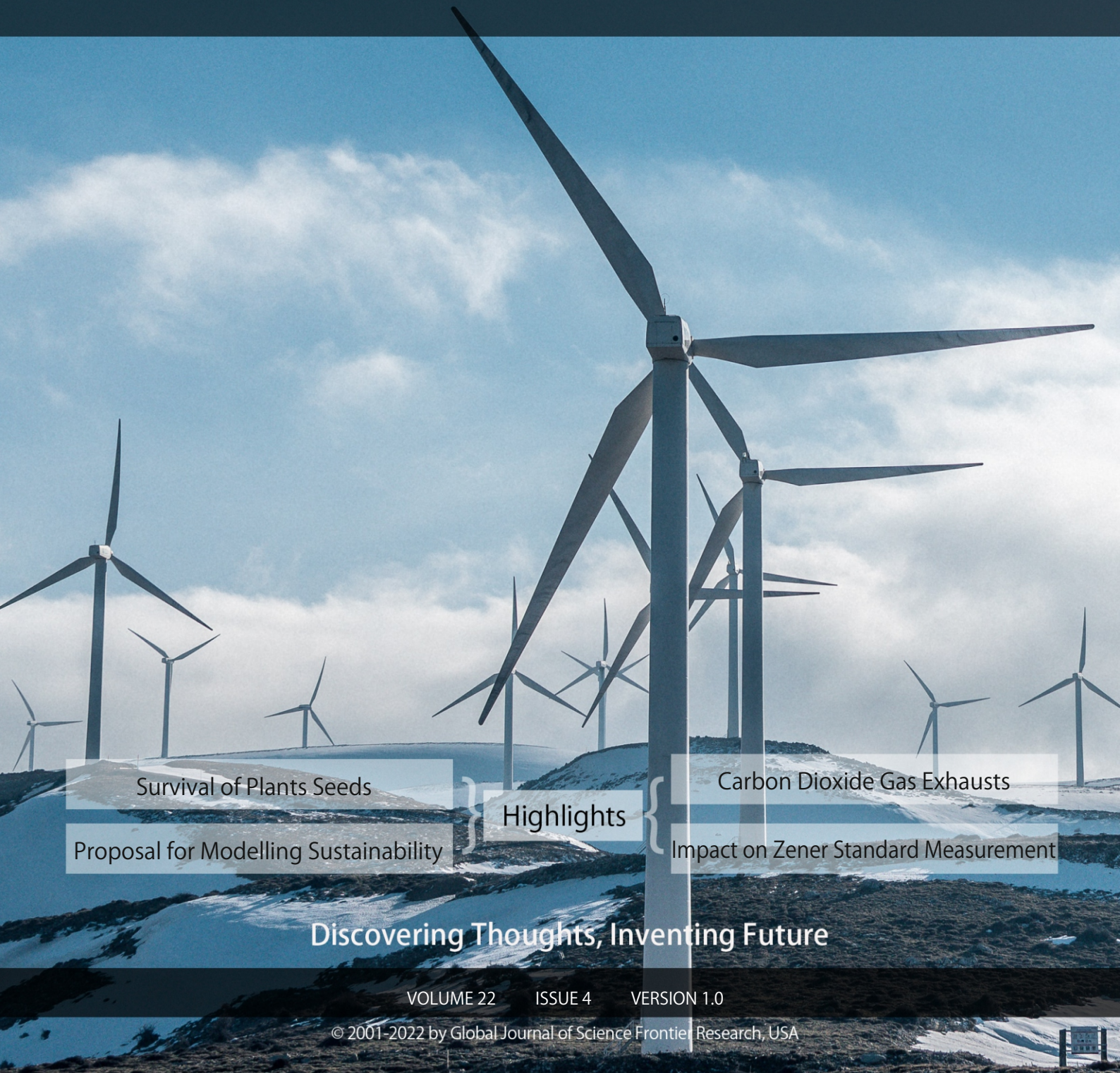
Online ISSN : 2249-4626
Print ISSN : 0975-5896
DOI : 10.17406/GJSFR

Global Journal

of Science Frontier Research: H

Environment & Earth Science



Survival of Plants Seeds

Proposal for Modelling Sustainability

Highlights

Carbon Dioxide Gas Exhausts

Impact on Zener Standard Measurement

Discovering Thoughts, Inventing Future

VOLUME 22 ISSUE 4 VERSION 1.0

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Volume 22 Issue 4 (Ver. 1.0)

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Editorial Board

Global Journal of Science Frontier Research

Contents of the Issue

Global Journal of Science Frontier Research: H
Environment & Earth Science
Volume 22 Issue 4 Version 1.0 Year 2022
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4626 & Print ISSN: 0975-5896

Design Prototype of Bio-Filter to Treatment of Carbon Dioxide Gas Exhausts

By Suliman, A.E, G.E.M. Nasr, M. A. Baiomy & H. M. Ahmed

Nasarawa State University

Abstract- The research aims to design and fabricate prototype of a bio-filter which used to process the emissions of CO and Co_2.That are mainly generated from the combustion of coal, oil and natural gas. These are main energy resources in our daily life whichused in different food activities as food factories and charcoal grills**.** The prototype consists of cylinder steel with two covers, two tubes welded on the outer face of each cover and candle of filter.Candlwas consisting of two circle walls and the space between two walls was 2cm In the experimentswere conducted on four cases frombio materialsas follows:- 1- grinded ficusgreen leaves 2-grinded green leaves after drying 3-dry sawdust, 4-Wet sawdust.Measurements were done at five times after 2, 4, 6, 8, and 10 min. from starting experiments.The moisture contents was measured to the agricultural residues (bio-materials) before and after experiments. Chemical analysis was done on the bio-material to measure the Co,Co_2befor and after experiments. Also,Co ,Co_2were measured in the air befor input prototype and after output.The results with bio.filter were: - with green leaves: Co_2 ratiodecreased to18% ,Codecreased to 2 %. And absorb of C ratio bygreen leaves was4.5%.

Keywords: air purifier, air pollution, carbon capture, direct air capture.

GJSFR-H Classification: DDC Code: 665.7 LCC Code: TN884

Strictly as per the compliance and regulations of:

Design Prototype of Bio-Filter to Treatment of Carbon Dioxide Gas Exhausts

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- *With dry leaves:* Co_2 decreased to 15%, Co ratio didn't change and absorb of C ratio bydry leaves was 0.07%.
- *With wet sawdust:* Co_2 decreased 0.03% and Co ratio didn't change.
- *With dry sawdust:* Co_2 and Co didn't change. The finel conclution was the ficus green leaves is the best bio.materials to use with bio-filter.

Keywords: air purifier, air pollution, carbon capture, direct air capture.

I. Introduction

EXhaust gases emissions from cooking and food processing activities very dangerous because it contain some toxic gases as Co_2 that cusses respiratory illness, and other chronic diseases, mental-health problems, asthma and potentially cardiovascular disease and cancer. Moreover, some gases Co, N_2, O_2, H_2O, PM, HC, So_2, No_2 which produce from unfired fuel is toxic gasas.

Hence, it must keep the components of natural air at 78% nitrogen, 21% oxygen, argon 0.9%, carbon dioxide 0.0390%, and water vapor at a variable rate (Singh et al., 2018). Air pollutants can define as any substance emitted into the air from an anthropogenic, biogenic, or gynogenetic source, that is either not part of the natural atmosphere or is present in higher concentrations than the natural atmosphere, and may cause a short-term or long-term adverse effect. Air pollution caused problematic health include breathing problems, respiratory illness, changes in the lung's defenses, and worsening respiratory, and cardiovascular disease. ElAziz et al.(2015).

World Bank (2016) reported that, In fact, exposure to air pollution is now the fourth in the world. (Ministry of agricultural, 2018-2019) reported that agricultural residues are national wasted wealth and are one of the riches untapped, because of burning and disposing of in different ways. Total agricultural residues in Egypt are about 43 million tons about 8 Million ton horticultural wastes, about 4 Million tons paper waste and can produce, and about 300 thousand tons from ficus paper waste leaves as a residues per year.

Unep (2004) explained that air pollutants can be divided into anthropogenic and natural pollutants according to their sources, or primary and secondary pollutants, which stem from reactions of primary pollutants when taking the production process into account.

Carbon dioxide (Co_2) emissions have become one of the most serious issues and this environmental concern is being faced by our civilization today. The major sources of air pollution are industrial emissions, vehicular emissions, and domestic emissions. Air is very important as it provides oxygen and other gases that are essential to all life on earth. It consists of a mixture of invisible gases that surround the planet. (SEPA, 2019).

These gases can purify before exit to air by using filters or different methods. There are many types of filters can be used based on the types of materials made some filters component is bio-materials to adsorb the emission contents from the exhaust gas. Li et al. (2011) explained that several methods have been developed and used to capture Co_2 from high emission sources and store it in different conditions.

Gary (2009) explained that Carbon capture and storage (CCS) involves the separation and capture of co_2 from flue gas or syn gas in the case of IGCC.CCS is a three-step process that includes:

1. LiOH absorption solution developed by NASA use the same principle but different compound

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2. Capture of Co_2 from electric generating units (or other industrial processes).
3. Compression and transport of the captured co_2 (usually in pipe lines) and under ground injection and geologic sequestration (also referred to as storage) of the co_2 into deep under ground rock formations.

Hussain et al. (2009) mentioned that the possibility to clean contaminated air with hyper accumulator plants has shown great potential. One of the most recently studied species used in phytoremediation applications is woody trees and ornamental plants. These plants can be harvested every 8 to 10 years to generate revenue, along with the added advantage of working as natural air conditioners.

Herzog et al. (2009) explained that carbon dioxide capture and storage (CCS) is the only pathway that can allow the world to continue to enjoy the benefits of using coal while drastically reducing the emissions associated with coal combustion.

To date, all commercial post-combustion Co_2 capture plants use chemical absorption processes with monoethanolamine (MEA)-based solvents. MEA has developed over 70 years ago as a general, non-selective solvent to remove acid gases, such as Co_2 and hydrogen sulfide, from natural gas streams. The amount of carbon dioxide (Co_2) in the atmosphere continues to rise and rather rapidly due to unparalleled cumulative Co_2 emissions. The percentage increased from 382 ppm in 2006 to 408 ppm in the 2018 level over time (Nasa, 2019).

Brethour et al. (2007) cleared that the agricultural residues can include about 6,000 species of cut flowers, potted flowering plants, houseplants, cut foliage, bedding plants, bulbs, cuttings for propagation, food and medicinal plants in greenhouses and outdoor-grown cut flowers and Nursery farmers produce about 9,000 species of annual and perennial plants, woody shrubs, deciduous, coniferous trees, roses, outdoor garden flowers, and Christmas trees. Ficusretusa is a kind of heavy, fast-growing, round-headed, and evergreen ornamental tree that can reach a height of 10 meters.

The research aimed to design and manufacture a locally bio-filter used to process exhaust gases produced by food factories.

II. Materials and Methods

This research was done from2019 to 2020 at Agricultural Engineering Research Institute "AEnRI" Min. Egypt to design and fabricate prototype device for treating and filtering carbon dioxide gas and carbon monoxide gas (exhaust gases) by using crop residues.

a) Design and fabricate prototype device

It was mainly consisting of:

Cylinder steel (12 cm outer diameter and 27.3 cm length) as shown in Figs (1 and2).Two covers from sheet metal 1.0mm thickness. The bottom cover has a hole 2 cm diameter in the center and the upper cover has a hole in the side. Two tubes (2.8 cm diameter and 3.8cm length) have been welded on the upper and bottom covers holes. A candle was fabricated from perforated mesh(0.5 mm) as adouble wall cylinder. The outer wall and inner wall diameters were 8 and6 cm respectively as shown in Fig.(3) It Was welded in the center of the bottom cover and Four vertical bar (5 mm diameter and 24 cm length) were welded on the inside face of the bottom cover as support of candle

b) Agriculture residues

- *Ficusretusa (Moraceae):* It is considered a plant belonging an evergreen trees with a thick shade that grows in various types of soils. It is distinguished as a huge water-loving tree. the grinded of fresh and dried ficus leaves were used in this reserch. as shown in Fig.(4)
- *Sawdust:* It is relatively abundant and inexpensive. Sawdust or wood dust is an industrial waste obtained by-products from cutting, sawing or grinding of timber in the form of fine particles. Sawdust largely consists of cellulose, it also contains soluble sugar, acids, resins, oils and waxes, and other organic substances.

The theory of the prototype device's operation is summed up in the passage of air which loaded with exhaust gases from the centerical hole of the lower cover of the device to the inner circumference of device candle. The exhaust gas passes from the center of the candle to the inner circumference of the device cylinder through the filter candle that filled with biomaterial that absorbs gases .The exhaust air exits from the side opening of the upper cover to the out side air without loaded by hurmful gasses as Co_2 and Co

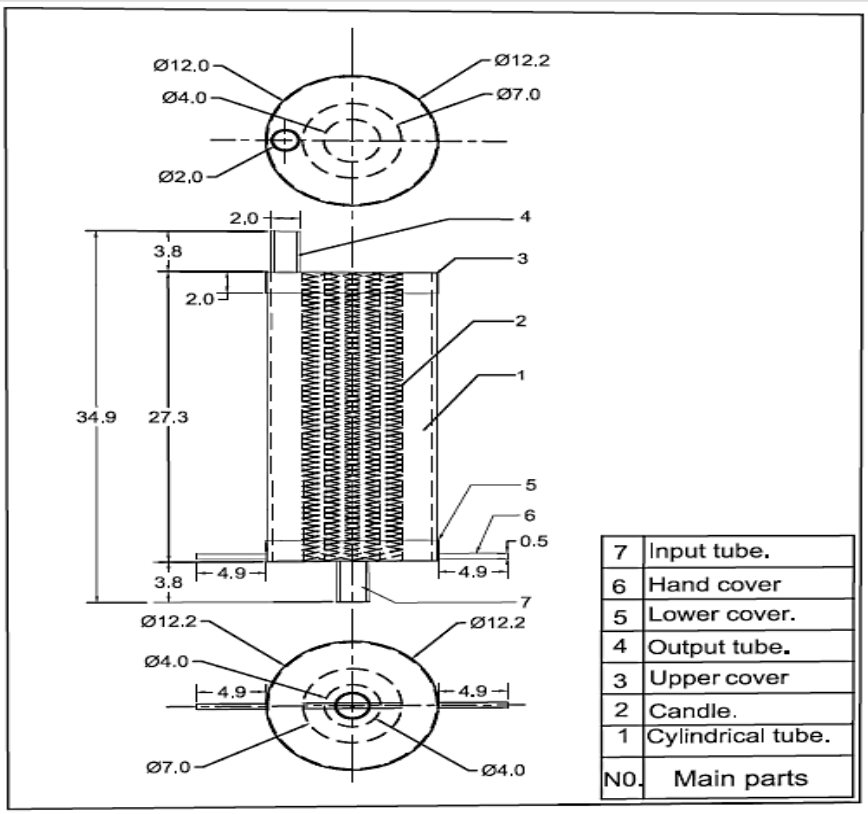
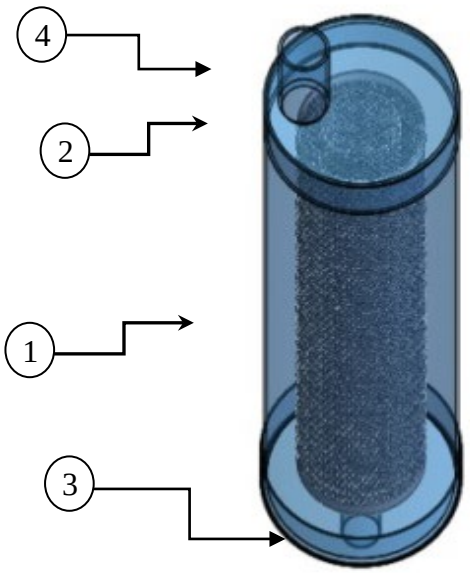


Fig. 1: Schematic diagram of prototype device



1: Cylinder tube steel 2: Cover steel 3: Input 4:Output

Fig. 2: Prototype device

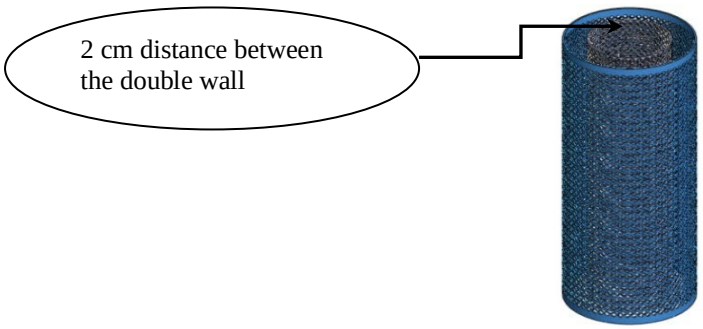


Fig. 3: A candle of filter

(A)

Green (B) Dry

Fig. 4: Ficus leaves and grinding samples

c) *Experimental procedures: It was divided into four steps*

First step; Preparing a combustion chamber for wood and wastes were resulting from its incineration: carbon dioxide and carbon monoxide. Second steps; includes preparing the residues, of; 1- Washing green ficus leaves and crinding it. 2- drying other green leaves at 70°C for 8 hours. After that grinded it to obtain the granular size less than 4.5 mm. 3- prepare sampl from the dry sawdust and other sample with high moisture by adding the suitable amount of water and determine its moisture contents.

Second step; the bio-filter was constructed to use with grinded green ficus (about 175 g) which put between the double wall of candle (Fig.5) fours step; evaluatation of the prototype device under experimental variables by randomized design in three replicates.; moisture content of ficus leaves (green and dry) and sawdust (wet and dry) and air quality with quality of bio.filter materials.

Fig. 5: Ficus leaves in candle

d) Measurements

i. *Moisture content (MC)*

The moisture content was determined by drying different types of agricultural residues at 70 C°until the weight become constant according to the method described by the AOAC, 2000.

$$MC = \frac{mass\ of\ wet\ sample - mass\ of\ dry\ sample}{mass\ of\ wet\ sample} \times 100, wb\%$$

ii. *Exhaust gases*

The gas components measured using by the device "Auto check" model 974/5 SPTC to measure Co_2 and Co of air before and after tests.

iii. *Chemical analysis of residues*

The carbon content of ficus leaves and sawdust was determined before and after tests in the laboratory of Faculty Science, Cairo–University, Egypt.

iv. The exhaust that resulted from the combustion chamber was measured at five times, 2, 4, 6, 8, and 10 min. from the beginning of the combustion process

v. *Mathematical analysis*

The data were analyzed using excel program 2017 to obtain the best fit curve and coefficient of determination for the relationship between Co_2 and Co as a measurements with the both of residues moisture contents and operating time.

III. Results and Discussions

a) Moisture content

The results of moisture content to different bio-materials before experiments were as shown in table (1) which used as filter media.

Table 1: The moisture contents of some bio-materials.

Biological materials	Moisture content %
Green Leaves officus	53
Dry Leaves officus	34
Dry sawdust	8
Wet sawdust	42

b) Chemical analysis of bio-filter media

The results of carbon components from chemical analysis for each ficus green leaves, dry ficus leaves, wet sawdust, and dry sawdust were 44.7%, 48.17%, 98.8%, and 98.87% respectively before the experiment. and there were 49.23%, 48.24%, 81.6 % and 98.87% respectively after the experiment as shown in table (2). Noted that, the carbon component with dry sawdust was not changing and it was decreasing from 98.87% to 81.6% with wet sawdust because of increasing the moisture content in the carbon ratio dry mass is decreasing.

Table 2: The ratio of carbon contents in bio-filter medias before and after treatments

Bio-materials	Before treatment	After Using bio-filter
Green Leaves officus	44.70	49.23
Dry Leaves officus	48.17	48.24
Wet sawdust	98.87	81.6
Dry sawdust	98.87	98.87

c) Influence of using bio-filter on Exhaust gases (Co_2 and Co)

i. *Influence of using bio-filter on Co_2*

First with the green leaves of ficus: The moisture content of ficus leaves after grinding it was 53% and 34% after drying it. the relationship between the Co_2 ratio which output from the prototype of bio-filter and different absorption times at different moisture content was as shown in fig.(6). At moisture content 53%: Co_2ratio were 1.15, 1.09, 1.06, 1.015, and 0.97 at different absorption times 2, 4, 6, 8 and 10 min. respectively .At moisture content 34%: Co_2ratio were 1.19, 1.15, 1.12, 1.09 and 1.04 at different times 2, 4, 6, 8, and 10 min respectively. Co_2 ratio was reduced from 1.19 to 1.04% when obserbation time was increased from 2 to 10 min respectively at moisture content 34%.also atmoisture content 53 % the Co_2ratio were decreased from 1.15 to 0.97% by increase the operating time from 2 to10 min respectively. The previous results were due to an increase in the absorption time, which leads to an increase in the biofilter's ability to absorb a greater amount of Co_2that present with the exhaust gas which passes through the prototype of the bio-filter.

The best fit curve is the polynimial to describe the effect of residues moisture conten (MC)on the Co_2using ficus leaves bio-filter at different operating times "T". The equations were:

At 34% M.C.Co_2= -0.0004(T^2) –0.0137T + 1.216 R^2=0.9930

At 53%M.C.Co_2= -0.0003(T^2) – 0.0257T + 1.195 R^2=0.9926

From the fitting Eq. It can see inversally relationship between the Co_2 content in used ficus leaves and the operating time. Therefore, the high coefficient of determination was R^2 = 0.9930 occurred at using the ficus leaves with 34% MC, while the other MC "53%" actualized about R^2 = 0.9926.

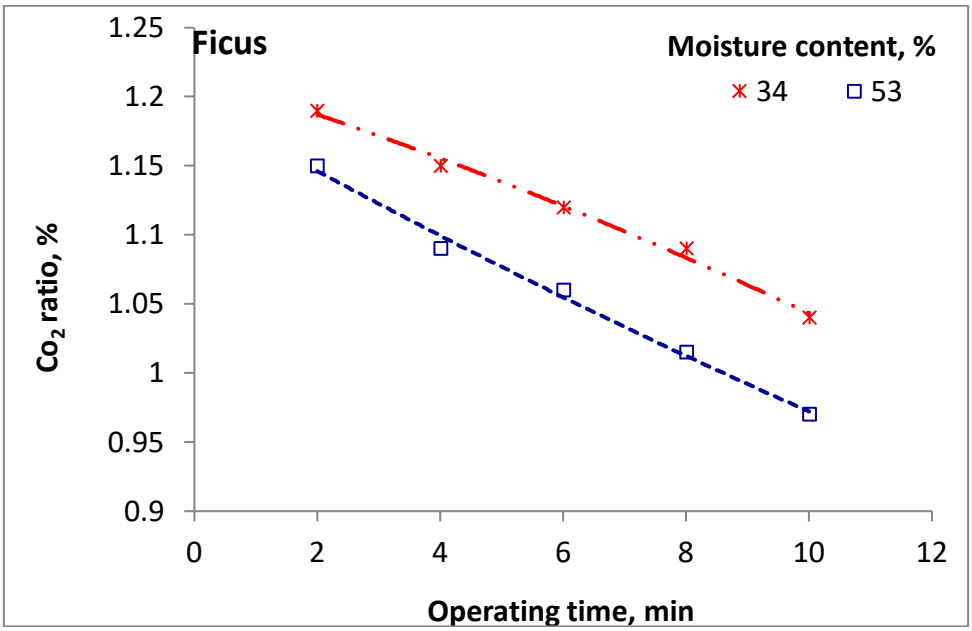


Fig. 6: The effect of using the bio-materials (Ficus leaves) on the absorption of carbon dioxide (Co_2)

Second with the sawdust: The moisture content of sawdust was 8% and 42%. The relationship between the Co_2ratio which output from the prototype of bio-filter and different absorption times at different moisture content was as shown in Fig. (7). At moisture content 42 %: Co_2ratio were decreased from1.28 %, 1.281.27%, 1.27 % and 1.27 %, at different absorption times 2, 4, 6, 8 and 10 minrespectively. At moisture content 8%: Co_2 ratio was constant at 1.28% with each different absorption times 2, 4, 6, 8 and 10 min. respectively. From previous results noted that the increase in the proportion of absorbing Co_2 was slightly with sawdust wet.

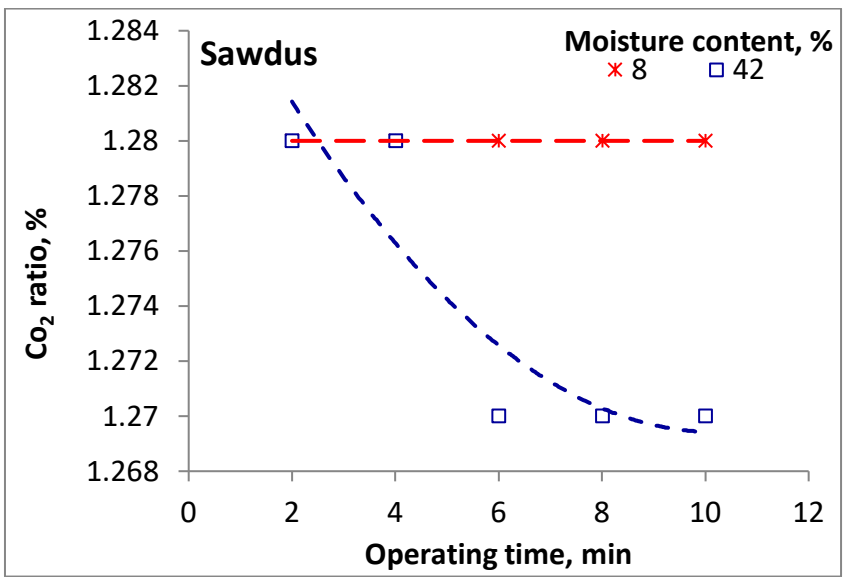


Fig. 7: The effect of using the bio materials (sawdust) on the absorpation of carbon-dioxide (Co_2)

ii. *Influence of using bio-filter on Co*

- *First with the green leaves of ficus:* The moisture content officus leaves after grinding was 53% and 34% after drying it. The relationship between the Co ratio which output from the prototype of bio-filter and different absorption times at different moisture content .
- *At moisture content 53%:* Co ratio were decreased from 1.72 % , 1.72 % ,1.72%, 1.72%and 1.69 %at different absorption times 2, 4, 6, 8 and 10 minrespectively.
- *At moisture content 34%:* Co ratio was constant at 1.72% with different obsorbation times 2, 4, 6, 8, and 10 min respectively.

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and different absorption times at different moisture content.

- *At moisture content 42 %:* Co ratio were limited for decreasing from 1.28% to 1.27% at different absorption times 2, 4, 6, 8 and 10 min. respectively.
- *At moisture content 8%:* Co ratio was constant at 1.28% with increasing the absorption times from 2, 4, 6, 8 and 10 min. respectively.

IV. Conclusions

The research concluded that the bio. filter were: - with green leaves decreased Co_2 ratio to18% and Co to 2 % and absorb the C ratio by leaves about 4.5%. while with dry green leaves Co_2decreased to 15 % and didn't effect on Co ratio. - with wet sawdust don't effect on Co ratio but decreased Co_2 0.03% while dry sawdust didn't effect on Co_2 and Co. the finel conclution was the ficus green leaves is the best bio. materials used with bio-filter

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Global Journal of Science Frontier Research (H) Volume XXII Issue IV Version I Year 2022
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Global Journal of Science Frontier Research: H
Environment & Earth Science
Volume 22 Issue 4 Version 1.0 Year 2022
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4626 & Print ISSN: 0975-5896

The Need and Opportunity for Sustainability in a Digital World Proposal for Modelling Sustainability

By Dr. Zoltán Verrasztó

Abstract- Our whole life is defined by the SPACE that provides its possibilities, framework and boundaries. For SUSTAINABILITY, it is in this space that we must ensure harmony between natural, social and economic influences and agents.

Today, there are environmental linkages in all of the natural sciences (and beyond!), but they are not built into a system of scientific requirements. The concept of the ENVIRONMENT is changing, legal disputes are based on the nature of environmental data, fact which consists an obstacle in the use of IT technology: exact data interpretation is the basis for the management and organisation of environmental data, for clustering, which is essential in network research - in our practical use,- environmental modelling.

Keywords: sustainability, environmental data, decision support in space, environmental modelling.

GJSFR-H Classification: DDC Code: 628.52 LCC Code: TD898.118

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I. Sustainable Development

"*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own* needs."[1] Its practice requires harmony between the living systems of nature and the needs of society. Development must reconcile the needs of society, population growth and the use of natural resources, minimising pollution of the environment.

The moral imperative of humanity and the harmony of the laws of nature should be realised by those who manage the economy. The consequences of technocratic rule are borne by the systems of the environment - society is 'merely' the ultimate agent of all this, significantly distant in space and time from the specific uses of the environment. It is in this 'magic' triangle that many of today's environmental conflicts become unresolvable.

This can only be changed by conscious planning based on multi-perspective decision-making, starting from an accurate knowledge and systematisation of environmental data. The concept and expectations of a 'liveable environment' are already undefinable, as we know [16]:

- Different social groups have different expectations of the target state of the environment
- The concept of a 'liveable environment' is a non-negotiable global expectation, but it does not allow for the localisation of specific decisions on the definition of specific environmental target states for local land use,
- The formulation of specific local environmental targets and the planning of environmental uses to maintain or restore the 'functionality' of environmental systems cannot be linked to the satisfaction of human health needs,
- The need for a 'liveable environment' does not provide the basis for the exact expectations or the *environmental data* necessary for planning environmental use, which can consist the basis of environmental modelling,

There is no doubt that the LANDSCAPE is the space [15] in which all the activities of our lives take place. All the natural, social and economic processes that are both necessary and intrinsic to our biological and/or social and economic existence take place in the LANDSCAPE.

The essence of this was already formulated a hundred years ago by Pál Teleki[2] [14], and then the "*geographical idea*" was given an exact geological content by Elemér Szádeczky-Kardoss[3] [13], who, even before J. Lovelock's Gaia theory[4], recognised that the entire material and spiritual culture of mankind forms an interconnected system, and called it *geonomy*. "*Geonomy is not only the investigative unit of the earth sciences, but also includes the fundamental biological subject of the origin of life, its inorganic determination. The real meaning of geonomy is not in the details, but in the study of the interrelationship of details. The new findings of geonomy show that the Earth is a single active system, with each area interconnected with the others....*" [3, 5] He founded environmental science, it would be important to deepen this with the need for *network research*.

In the world we know in increasing detail, which functions as a unified system, our natural and social environment can only be understood in a unified system,

Author: PhD, Retired Director, Regional Environmental Authority, Budapest, Hungary. e-mail: z.verraszto@gmail.com

[1] Brundtland Comission, 1987

[2] https://hu.wikipedia.org › wiki › Teleki_Pál_(politician)

[3] https://hu.wikipedia.org › wiki › Szádeczky-Kardoss_El..

[4] https://hu.wikipedia.org › wiki › Gaia-theory

as a unified system, and only in a unified system, as a unified system can the future state/[condition of existence] of Homo sapiens, the *SUSTAINABLE DEVELOPMENT,* capable of meeting the natural and social needs of the species, be ensured.

II. Environmental Modelling

Nowadays, IT technology makes it possible to study this in detail. The application of GIS in many areas expands the possibilities for identifying, interpreting and analysing transdisciplinary relationships in dynamic relationships, but current practice is limited to the visualisation of information [10]:. The starting point for environmental modelling is that the processes under investigation take place in a common space - in the interpretive domain of earth sciences, this is the landscape. [Verrasztó, 1979]

Natural, social and economic processes are linked here, and their data components can be modelled by a suitably structured overlay map system[5] that represents their real-world relationships. [6] The assessment of sustainability is a spatial, multidimensional decision task.

A distinction is generally made between the natural and the man-made environment, and the relevant scientific literature to date defines the role of human society and its mechanisms of action as landscape-forming factors in their own right. In contrast to this, we believe that human society can in no way be regarded as an independent landscape-forming factor, since its effects, which are beyond any argue decisive, and their consequences are *embedded in the mechanisms of action of landscape-forming factors*, and exert their effects and bear the consequences [16] This statement of professional approach also provides the clarifying the concept of environmental data, their digitalisation and thereby the *possibility of their systematisation.*

Population preservation and production objectives must be reconciled with social, cultural, environmental stabilisation and nature conservation objectives. [19] The map-based decision support we propose will ensure that complex, spatially integrated, multi-perspective decisions can be made accurately. The key to solving this task is the clustering of the "Big Data" dataset, the structuring of the data sets and then the harmonization of the data layers.

The practical implementation of this should be based on: [8]

- To break down the information we have about our environment into data components,
- The placement of the individual data in the environmental system (according to the classification system of thematic maps, see annex),
- The specification of the x, y, z coordinates of each data item,
- Juxtaposition of the date of each data, 'sample',
- Constructing thematic maps from the spatial, temporal and environmental data,
- Designing a visualisation system for thematic maps, with particular attention to the need to examine the relationships between thematic overlays
- However, as society develops, a multitude of interconnected and interacting systems must - or should! – be considered in order that the natural, social and economic factors can be studied and understod together, without which 'sustainable development' will remain an empty slogan.

III. Resource Protection

Many people see resource protection as the task of environmental protection, and in many ways we have to agree with this, but we must not forget that the concept of resources varies in space and time, from rock shale to rare earths. And human history is in fact a struggle for resources.

I consider striking the fact that only two of the 17 sustainability objectives adopted by the UN, the protection of oceans and seas (14) and the protection of terrestrial ecosystems (15), are focused on the natural foundations - however there is no doubt that the local specificities of natural resources provide the limits and opportunities for society and the economy.

It is remarkable that there is no attempt to realise the global social and economic objectives of sustainability in local terms, even though it is the local conditions of the natural environment that provide the constraints and opportunities for society and the economy. It is difficult to reconcile the reduction of the rural way of life and the promotion of urbanisation with the vision of our civilisation! The unbridled energy demand of cities, the vulnerability of their entire supply and the concentrated production of waste, beyond the breakdown of family and social ties, render their future questionable.

Botanical research has shown that the diversity of flora in Central Europe reached its maximum during the industrial revolution. Around 4500 BC, the diversity was less than 50% of this. The massive urbanisation that followed – in fact originated from - the industrial revolution, the concentration of agricultural production, the land use for transportation, mining and industrial production, the overuse of the environment, the disproportionate overuse of energy and the discharge of waste, caused a drastic loss of diversity. What the progressive use of the environment in this respect has built up over 2500 years has been completely destroyed by overuse over the last 250 years. The consequences of continuing this trend are unforeseeable.

[5] https://adoc.tips › download › komplex-water management-t.. *Verrasztó* Zoltán: classification system of *thematic maps*

Ecological economics tries to draw attention to the indispensability of environmental goods, but in its experiments it mostly [17]:

- lacks an exact analysis in an exact environmental system,
- lacks an extended interpretation and analysis of spatial relationships,
- lacks an explicit assessment, interpretation and examination of the different interests in different environmental target states

Nowadays, environmental economists prefer multi-perspective and participatory valuation, pointing out that it allows a much richer definition of value than monetary valuation. It cannot be disputed that their practice reflects the value dimensions, opinions and feelings of the social groups they consider to be 'stakeholders' in relation to ecosystem services, in contrast to the earlier practice of monetary valuation. They believe that these methods are characterised by a value judgement based on the role of the citizen rather than on individual consumer preferences, which can lead to more responsible action that takes into account long-term processes and the interests of future generations.

On the other hand, while not disputing its advantages over previous practices, we would like to point out that *neither* this method reflects the *needs and opportunities* for exploring and communicating the conflicts that arise from real knowledge of science.

We would like to stress that the real value cannot depend on the value judgement of a community, whatever it may be, and that the need for its preservation must not become a function of a social decision whose expertise is very limited and whose interests may be very different from the possible damage to the environmental system. The social interest groups making the decision may also be strongly divided. The spatial and temporal consequences, the advantages and disadvantages, the advantages and the detriments of the environmental use to be implemented are different, as are the advocacy capacities of the social groups concerned.

The practice followed to date has not been able to take into account all the problems arising from

- The different needs of individuals and social groups in different situations with regard to the environmental target status,
- Different spatial and territorial consequences, benefits and harms of environmental use,
- There are differences in the benefits and harms of environmental use in the short, medium and long term,
- The groups involved in the decision-making process differ significantly not only in their needs, but also in their capacity to assert their interests
- The groups involved in the decision-making process do not have sufficient knowledge or depth of information about the real consequences of their decisions

On the other hand, we would like to point out that they do not even express the following as needs

- The need to examine the complexity of natural systems,
- The need for a professional assessment of the consequences for those affected,
- The need to consider the consequences over time,
- The need to weigh potential consequences, which cannot be condensed into a single unit of measurement,
- The assessment of the unique and ungeneralisable characteristics of the subsystems of the environmental-social system functioning as a network

IV. Map Decision Support

Our proposed method of map decision support [1, 8, 11]: includes the need and the possibility of multi-criteria decision support, but does not require the result to be compressed into a single "unit of measurement". The method is suitable for the precise analysis of spatial decisions - i.e. the consequences of a decision - that seek to explore, or attempt to explore, in their own context, the complex system - or network - of natural, social and economic relationships that take place in the *landscape as a given space*. The key word is *'their own context'*, since there is a sharp distinction between the effects of closed inanimate systems and those of open living systems within their own systems, and their interactions in their interrelationships, but the components of these also require different measurement methods and qualitative and quantitative qualification.

Obviously, the accuracy and technical depth of this depends on the data being uploaded at any given time. By applying our concept of ENVIRONMENT = LANDSCAPE [15, 7], we can lay the foundations for seeing/observing and analysing

- The exact network of relationships,
- The main - and subsystems of networks,
- The interconnections between society and its environment,
- The components of a holistic system, thus enabling the realisation of an information system,
- Methodological development of the practice of risk analysis through the information system,
- The possibility of a multidisciplinary and multi-functional extension of the information system,

In order to structure the information available on our environment into data components according to the specific needs and possibilities of the real data relations [1, 2, 5] - in fact network subsystems - to be examined. An essential starting point for all this is

- The conceptual sketch of the environmental system (environment = landscape),
- Interpretation of the concept of environmental data (characteristics of the landscape components)
- landscape characterisation cumulated from exact data (thematic maps)
- Structuring thematic map overlays in a goal-oriented way

Harmony in our time should be ensured by conscious planning, exact calculations and environmental modelling.

The following objectives are set for the implementation of the environmental modelling:

- To link or enable the connection of biologically, physically and/or chemically related processes, and to investigate their spatial relationships
- Enable the investigation, evaluation and comparison together of impact factors and the affected
- Enable the examination in coherent data systems the information and data sets arising from legal obligations (e.g. knowledge of environmental status)
- Possibility of examination of changes over space and time
- Causal relationships between the indications observed for each environmental characteristic can be investigated
- The spatial information system to be developed should be able to meet the decision support needs of public authorities requiring, using and generating spatial data
- The spatial information system to be developed should provide a coherent basis for meeting the requirements of EU regulations on sectoral details
- The spatial information system to be developed should be able to provide information to the widest possible areas of society on the state of the environment and its changes
- The spatial information system to be developed must be able to provide the basis for all social decisions that facilitate the adaptation of society to environmental conditions and their changes.

V. Harmony

Rural areas have been reduced to a mere agricultural production area, losing their biological and social functions. As a consequence, land use and other interventions have been guided only by the need to increase the efficiency of production, thereby - eventually visibly - endangering the functions of living space. Under such circumstances, environmental degradation and the destruction of nature not only lead to a decline in production, but also seriously endanger human livelihoods.

The productive, consumption, social, community and cultural functions of rural areas have thus become 'redundant'. To this day, they are still widely debated by economic decision-makers, their land requirements and aspects are seen as an economic burden. We now know that in the long term, only management based on these three aspects can be sustainable.

The production functions, which are essentially market-driven and which, in addition to the production of food, have become the exclusive preserve of non-food products (renewable raw materials, energy sources, etc.), and the natural, social and cultural functions associated with the environment, the landscape and the land have been essentially eroded as a result of these historical changes.

Local adaptation, reliance on local resources, was not only an ecological or socio-regional, but also an economically rational endeavour in the past.

VI. The Basis of Future Development is the Natural, Social and Economic Cohesion

It has already been pointed out that, since the natural environment determines social and economic possibilities, its spatial limits are an essential requirement for systems analysis. The watershed or the geological landscape is suitable for this purpose.

The LANDSCAPE → LANDSCAPE FORMING FACTORS are geological structure - geological topography - relief - climate - hydrology - biota - land cover, but linking social and economic aspects to this system can generate a number of debates. [16] Although the study of social and economic systems is one of the roots of network research, their *value-driven* nature and analytical practices make the grouping of them less exact and thus more controversial.

As the most important elements of SOCIAL COHESION, attention has been directed towards the study of cultural, religious, linguistic and historical aspects, embodied in traditions, folklore, legends, folk music and elements of folk art. In essence, the notion of COMMON SOCIAL SPACE fills the objective space of the LANDSCAPE, which can be studied by the natural sciences too, with the value-driven functioning of social systems, in which the *past, evolution and present* of a multitude of common actions, beliefs and constructs provide the points of connection and the possibilities of group formation.

Huntington[6], with his astonishing foresight, predicted that after the 20th century, built on the struggle of Western ideologies and concepts of life (Nazism, Communism, liberal democracy), history would not end but, on the contrary, would begin anew, with

[6] https://hu.wikipedia.org › wiki › The Clash of Civilizations

the clashes between religions, cultures and nations that were familiar from the old days. The 21st century will be about the clash of civilisations - *if there are still any left to clash*. There will still be more civilisations and societies, there will be more human beings, because today this is already questionable, at the rate at which we are consuming the Earth's resources and making our living conditions impossible. The examination and interpretation for the future of the relationship between society and its environment cannot be delayed any. We need to find back the harmony we have lost.

An inalienable part of this harmony is our identity, because human identity is made up of many things: gender roles, family patterns, religious beliefs and one of the most important components of human identity: national-cultural identity. Each of these is determined by the landscape that has guided the social development of our families and ethnic groups over the centuries - it is, in fact, the gene of society!

"*Man's consumerist approach, driven by the gears of today's globalised economy, often homogenises cultures and impoverishes the vast cultural diversity that is the treasure of humanity. Therefore, the tendency to solve all difficulties with uniform regulations or technical interventions leads to a disregard for the complexity of local problems that require the active participation of the population. The new processes that are started cannot always be fitted into an external framework, but must be based on local culture. Just as life and the world are dynamic, care for the world must be flexible and dynamic. Highly technical solutions risk taking into account symptoms that do not correspond to the deepest problems. The perspective of the rights of peoples and cultures must also be taken into account, and thus it must be understood that the development of a social group presupposes a historical process in its own cultural context, and requires that the actors of local society play a leading role on a permanent basis, based on their own culture. Even the notion of quality of life cannot be imposed on others, but must be understood within the context of each group of people's own world of symbols and customs.*"[7]

The grouping principles of ECONOMIC COHESION are closely intertwined with the traditional aspects of resources and division of labour, but also with historical relations, natural and social resources, political, institutional and logistical relations, and many elements of social and economic cohesion. Multi-generational family ties are a significant factor in sustainability, but their maintenance and 'operation' can only be based on a range of governmental concepts.

Adaptation must be the basis for planning society's use of the environment. The economic, environmental, social and regional functions of space should be taken into account, and specific trade-offs tailored to local specificities and particularities could at least reduce the gap between the exponentially increasing demands of society and the catastrophic rate of environmental degradation. We have also seen that it is not an easy task to enforce these demands against the day-to-day, short-term profit-maximising intentions of decision-makers.

VII. Epilogue

The particularities of environmental conflicts in society are in fact clashes of land use concepts. They are determined by the expectations of interest groups and the diversity of social demands, but also by the clash of past and future needs, opportunities and interests.

One reason for optimism is that, although in the recent past the social mechanisms were exclusively based on 'one-option decisions' to exploit our environment as a resource, many public and civil society organisations are now trying to impose environmental requirements on the economic players who determine the way the world works. Schumacher has already shown the way: (Small is Beatiful, 1980): *Each development district must have some kind of inner cohesion and identity! We need a cultural structure as well as an economic structure!* -And, we must add, it is essential to know and take into account the links between the natural and *landscape factors* in the history and present of each element, since we know that the principles of social ordering above the individual are in fact group-forming elements, and the task of adaptation has guided their development over a long history.

This is how the practice of environmental protection brings us to the Europe of the Regions.

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Global Journal of Science Frontier Research: H
Environment & Earth Science
Volume 22 Issue 4 Version 1.0 Year 2022
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4626 & Print ISSN: 0975-5896

Tidal Force Leap May Cause Malignant Impact on Zener Standard Measurement and Even Aircraft Instrumentation System

By Ling-Xiang Liu

Introduction- From 1996 to 1997, the National Metrology Centre of Singapore (NMC) coordinated the 3rd Asia Pacific Metrology Program (APMP) comparison of dc voltage using a Zener traveling standard. The comparison results at 1.018 V showed a zigzag curve among those laboratories that used their Josephson Array Voltage Standards (JAVSs) for this comparison. The amplitude of the zigzag was more than 1 part in 10^7, much larger than the typical uncertainty of such standards. These results motivated NMC to search for an explanation, which finally led to the development of an approximate mathematical model to describe this phenomenon [1]. During this developing period a surprising phenomenon was observed: Continuously measured dc voltage output with a periodic fluctuation pattern correlated with the times of tide high and tide low [2]. In addition to this, [2] also mentioned another observation that some of measurements carried out exhibit vast errors during spring tide. Through water molecules' adsorption or desorption on the insulation of a wiring harness forming the voltage divider, which is situated in an air sealed thermostat of a measured Zener cell, the dc voltage output was very strongly disturbed by spring tides.

GJSFR-H Classification: DDC Code: 510 LCC Code: TL574.W3

Strictly as per the compliance and regulations of:

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Also, in 2002, there were some reports of more amazing effects due to tidal changes: Hinderer *et al.* reported tides, earthquakes, and ground noise as seen by the absolute gravity measurements using different measurement methods: The results have very evidently shown the tidal gravity change in Strasbourg in June 1997 as an example [3]. Kasahara explains in his Perspective: Studies provide evidence that tidal forces influence earthquakes associated with volcanic activity, and new results from the Juan de Fuca Ridge in the Pacific show an obvious diurnal pattern attributed to ocean tides [4].

It is worth for a further consideration: there may be a terrible impact on some elements; especially they have a crucial function in a very powerful system; when, a spring tide, earthquake, or any other acute external condition change is just coming, it may cause a catastrophe! A sensitive example that should attract attention is the issue of safe flight of passenger airlines regarding aircraft instrumentation. The pilot's dependence on flight instruments is relatively high, because they often wholly lose the external visual reference. Most, the aircraft instrumentation system becomes their only source of visual information to determine the aerodynamic state of the aircraft.

Measurements of an airplane's speed, altitude, and angle of attack, for instance, are imperative. Usually, the airspeed indicator works by comparing dynamic pressure from the pitot tube and static pressure; measuring the air pressure is a simple and effective way of measuring altitude, and,; the angle of attack can be measured using a mechanical wind vane. Tidal forcing of airplane's instrumentation may not be more insensitive than of Zener measurement, and of zone earthquakes with volcanic activity. When a spring tide, earthquake or any other acute external condition change is just coming, especially on the Pacific "Ring of Fire," where Earth plate collisions, volcanic eruptions, tsunamis, and earthquakes are frequent, what would happen: the cockpit controls would be overwhelmed and even totally at a loss. Maybe that is why Boesser has so suggested [5]: While detailed causes of the stalls often vary, it is assumed by the General Aviation Joint Steering Committee (GAJSC) in 2012 that a significant contributing factor to some stall accidents may be a deficit in the pilot's aerodynamic state awareness caused by limitations or gaps in aircraft instrumentation.

To compensate for the deficit mentioned by GAJSC, it may be more helpful for the judgment of pilots when they encounter abnormal instrumentation indications: If an instrument based on entirely different physical working principle can be introduced into the instrumentation system or just as a reference, for example, a laser airspeed sensing instrument. A reliable instrumentation system with anti-interference ability is the most crucial fundamental trust to allow pilots to fly safely for either automatic or manual control even when they cannot see the ground or horizon. From the latest media reports, "The number of deaths from global plane crashes rose sharply in 2018", a revelation would be: To make the aircraft instrumentation more reliable.

The largest annual tidal range can be expected around the time of the equinox if it coincides with a

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spring tide. Recent China Eastern Airlines Flight 5735 crashed on March 21, 2022 (all 132 victims on board were confirmed, including 123 passengers and nine crew members), seems to fit this annual spring tidal force-time pattern:

According to the Chinese lunar calendar:

Spring equinox: March 20, 2022, at 23:29

Perigee spring tide: March 21, 2022, at 14:05

(based on the data of the world's largest astronomical tide spectacle — — Qiantang River tide in Zhejiang province of China [6]);

Flight 5735 departed Kunming Changshui International Airport, at 13:15 for Guangzhou Baiyun International Airport scheduled to land at 15:05, and crashed in the mountainous regions of Teng County, *Guangxi Zhuang Autonomous Region:*

March 21, 2022, at 14:22.

Usually, high tides are called **spring tides,** but they have nothing to do with the season. Perhaps the name comes from the German word "**Springen**," meaning **"to leap."**

The most extensive annual tidal range, namely, the most giant tidal force leap, may cause the pilot's aerodynamic state awareness to stuck in blind spot, even under an automatic control, it is not impossible, suddenly to enter an almost vertical dive, until the horizon being vaguely recognized, it seems too late to try a cockpit manual control — unable to return to the sky.

Maybe in this way, really a gravitational force jump may cause a malignant impact on an aircraft instrumentation system and, therefore, on flight safety, finally leading to a catastrophe.

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Global Journal of Science Frontier Research: H
Environment & Earth Science
Volume 22 Issue 4 Version 1.0 Year 2022
Type: Double Blind Peer Reviewed International Research Journal
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Survival of Plants Seeds and Bacteria in a Picosatellite Sent to the Stratosphere

By Juan Manuel Sánchez-Yañez & Christian Martinez-Cámara

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Summary- The theory that life on planet Earth is based on the fact that plant seeds and prokaryotes have shown the ability to survive extreme environmental conditions. The objective of this research was to analyze the survival of plant seeds and genera of probiotic bacteria released in a picosatellite to the atmosphere. In that sense seeds of *Beta vulgaris* (beet), *Lactuca sativa* (lettuce), *Solaneum lycopersicum*, as well as probiotics *Lactobacillus plantarum, Leuconostoc lactis, Bifidiobacterium citreum*, were prepared in petri dishes and placed in a container of a picosatellite sent from the city of Morelia, Michoacan, Mexico: the seeds were germinated and the probiotic bacteria were evaluated before and after of the trip by the picosatellite, the experimental data were analyzed by ANNOVA-Tukey. The results indicated that only survival the seeds of *B. vulgaris* as well as the genera of *La. plantarum* and *Le. lactis*. This shows that in seeds and bacteria there are mechanisms that prevent the death of both in extreme conditions of the stratosphere.

Keywords: *extreme physical conditions, life. latency, prokaryote.*

GJSFR-H Classification: *DDC Code: 579.3012 LCC Code: QR72.5*

Strictly as per the compliance and regulations of:

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I. Introduction

There is a theory that the origin of life on planet Earth comes from outer space, at the same time it has been shown that genetically both plants and microorganisms on this planet have information that allows them to survive extreme conditions of temperature, pressure, UV radiation and other that they prevent it (Rothchild and Mancinelli, 2001; Beck-Winchatz and Bramble, 2014; Coleman and Mitchell, 2014; Caro et al., 2019; Antunes, 2020; DasSarma et al., 2020; Diez et al., 2020;). The foregoing is supported by the response of both life lines subjected to such conditions (Berry et al., 2010) in addition to the research known as exobiology that endorses it with tests of seeds and microorganisms launched into the stratosphere by means of spikes and nanosatiles (Murcray et al., 1969; Coleman and Mitchell, 2014; Caro et al., 2019). The objective of this research was to demonstrate the survival capacity of seeds of *Beta vulgaris, Lactuca sativa, Solanum lycopersicum, Bifidiobacterium citreum, Lactobacillus plantarum and Leuconostoc lactis* in a Picosatellite trip to the stratosphere.

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Author σ: National Technology of Morelia, Morelia, Michoacan, México.

II. Material and Methods

a) CanSat-type picosatellite

The biological samples were sent to stratosphere in CanSat-type picosatellite was made by students of directed by Dr. Edgar Cárdenas-Escamilla from Engineering Electronic. National Technology of Morelia, Morelia, Michoacan, México. Have three prefabricate printed circuit board. The sensor board has two analogues sensors, one pressure sensor to calculate the altitud of the CanSat. Also, to program the processor board to handle data the transmission frecuency is adjusted in the program and container with two Petri dishes containing plant seeds and bacterial samples that were exposed to direct stratospheric environmental conditions (Smith et al., 2014; Smith and Sowa, 2017).

The CanSat picosatellite was launched on February 20 of 2020 at 11 am from Morelia, capital of State of Michoacan, México (video playback https://youtu.be/ICQQFuayN2w). The balloon ascended for 2.5 h to a mean float altitude of 38.2 km where it remained for 4 h, followed by a 35 min parachute descent, at Ciudad Hidalgo, Michoacan, México landing at 97 km from Morelia at the northwest of the launch site 19◦42 north latitude l00◦33. The sample exposure began during the ascent to 21.4 km with the opening of the Trex-Box shutter at 1521 UTC and ended 6 h and 10 min later with the closing of the Trex-Box shutter during the descent to 22.0 km at 2040 UTC. To evaluate the effect of the environmental conditions: 20-25km high, -70°C, 10-12% relative humidity; 0.0042, including the UVB radiation estimated total of 1148kJ m^{-2} of UVA. The CanSat was transferred from Ciudad Hidalgo to Morelia for 1.50 minutes, but the petri dishes with plant seeds and bacteria in a container with ice at 5oC to measure the viability of both, plant seed and bacteria at the stratosphere on the viability of seeds of *B. vulgaris* (beetroot), *S. lycopersicum* (tomato), and *L. sativa* (lettuce). A viability test was performed before and after (Saruyama and Tanida, 1995), being sent to the stratosphere on the CanSat 6 picosatellite (Beck-Winchatz and Bramble, 2014; Caro et al., 2019). As well as the genera and species of probiotic bacteria isolated from natural yogurt: *B. citreum, La. plantarum, Le. lactis* by viable plate count in nutrient agar (g/L): 10.0, glucose; 5.0, casein peptone; 1.0, yeast extract; 18.0, bacteriological agar, the concentration of each was

reported as colony- forming units per ml (Smith et al., 2014).

Table 1: Percentage of germination of *Lactuca sativa, Solanum lycopersicum and Beta vulgaris* at solarium and sent to the stratosphere

Seed+	Germination percentage (%)	
	In solarium	sent to the stratospher4
Solanum lycopersicum	96.66[a]*	0.0[b]
Lactuca sativa	90.33[b]	0.0[b]
Beta vulgaris	96.66[a]	46.6[a]

*+n=4 *values with different letters had a statistical difference (P<0.05) according to ANOVA-Tukey*

III. Results and Discusion

Table 1 shows the survival of 46.6% of the *B. vulgaris* seed in the picosatile at the environmental conditions of the stratosphere 25 km high at a temperature of -60 C as well as UV radiation and cosmic rays for a interval between 2 hours before declining, it is possible that the type of crioprotector, combined with the relatively short time of exposure to these conditions, favored the survival of the *B. vulgaris* seed in contrast to the total loss of viability of the *L. sativa* seeds. and *Solaneum lycopersicum* (Saruyama and Tanida, 1995; Wang et al., 2018) compared to the high viability of all seeds under controlled conditions of temperature 25 C in the absence of light and normal atmospheric pressure in a terrestrial environment.

Table 2 shows the survival of the genera and species of probiotic bacteria *B. citreum* that, launched in the satellite peak into the stratosphere, did not survive in that environment, in contrast, *La. plantarum* of the original total exposed survived 3%, while *Le. lactis* reach 6.9%. It is possible that the cryoprotectants that they possess as well as the DNA repair enzymes have prevented the death of these probiotics based on the relatively short time in which they were exposed (Berry et al., 2010; Smith and Sowa, 2017 DasSarma et al., 2020).

Table 2: Survival of *Bifidiobacterium citreum, Lactobacillus plantarum* and *Leuconostoc lactis* sent to the stratosphere

Probiotic strain tested	Probioctic strain (control)	Sent to stratosphere
	Bacteria UFC X10^7	Bacteria UFC X 10^6
Absolute control (AC)	0^{c}*	0^{b}**
Lactobacillus plantarum	263^{a}	102^{a}
Bifidobacterium citreum	107^{b}	0^{b}
Leuconostoc lactis	133^{b}	92^{a}

+n=4, values with different letters had statiscally difference (P<0.05) according ANOVA-Tukey*

III. Conclusion

Experimentation with picosatellites launched into the stratosphere containing plant seeds and probiotic genera and species that do not produce spores are a model for the survival of life on Earth despite adverse conditions. What can help the understanding of diseases in humans, plants and animals that are dispersed by the wind in the different environments of the planet. Ongoing research will help establish public policy in human and plant epidemiology.

Acknowledgments

To project 2.7 of the CIC-UMSNH (2022) for the facilities for the publication. To Phytonutrimentos de México and BIONUTRA, S.A, de C V Maravatio, Mich; México to support this publication.

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Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/ photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution at final image size ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs): >350 dpi; figures containing both halftone and line images: >650 dpi.

Color charges: Authors are advised to pay the full cost for the reproduction of their color artwork. Hence, please note that if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a Color Work Agreement form before your paper can be published. Also, you can email your editor to remove the color fee after acceptance of the paper.

Tips for Writing a Good Quality Science Frontier Research Paper

Techniques for writing a good quality Science Frontier Research paper:

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of science frontier then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

5. Use the internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.

6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

The Administration Rules

Administration Rules to Be Strictly Followed before Submitting Your Research Paper to Global Journals Inc.

Please read the following rules and regulations carefully before submitting your research paper to Global Journals Inc. to avoid rejection.

Segment draft and final research paper: You have to strictly follow the template of a research paper, failing which your paper may get rejected. You are expected to write each part of the paper wholly on your own. The peer reviewers need to identify your own perspective of the concepts in your own terms. Please do not extract straight from any other source, and do not rephrase someone else's analysis. Do not allow anyone else to proofread your manuscript.

Written material: You may discuss this with your guides and key sources. Do not copy anyone else's paper, even if this is only imitation, otherwise it will be rejected on the grounds of plagiarism, which is illegal. Various methods to avoid plagiarism are strictly applied by us to every paper, and, if found guilty, you may be blacklisted, which could affect your career adversely. To guard yourself and others from possible illegal use, please do not permit anyone to use or even read your paper and file.

Criterion for Grading a Research Paper (Compilation) by Global Journals

Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals.

Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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Global Journal of Science Frontier Research

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ISSN 9755896