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ASSESSING ECOLOGICAL AWARENESS LEVELS: A NEW MULTI-DIMENSIONAL CONCEPTUAL FRAMEWORK

Assessments of ecological awareness levels are immensely crucial in ecological awareness studies, especially for a developing country like Kazakhstan, which has struggled and is still struggling to address various environmental problems ranging from the Aral Sea to water deficiency matters. While many scholars have addressed the specific aspects of environmental problems such as air and water pollution, there is limited amount of work on addressing ecological awareness levels among the general population by local Kazakhstani scholars. This paper's research objective was to propose a new conceptual framework for assessing ecological awareness levels. It consisted of four main dimensions: cognitive, affective, altruistic and conative dimension, for which each of the following dimensions different research instruments were introduced. For that, the paper extensively researched, emulated and re-applied the theoretical frameworks and concepts of the works of Western scholars. The aim of this research is to fill the research gap on the lack of conceptual frameworks in assessing the general public's level of ecological awareness in Kazakhstan. The results obtained from this paper was the introduction of a new multi-dimensional framework and the applicability of three new research instruments for future academic studies in the context of Kazakhstan. These new research tools included the 15-item EEV Scale Model, 26-item Environmental Risk Perception Scale Model, and the 18-item EAS Model. This paper provided researchers with immensely valuable research instruments for pinpointing differences in environmental values, beliefs, concerns, and perceptions of different sample populations in Kazakhstan.

Key words: Kazakhstan; ecological awareness; conceptual framework; assessment dimensions.

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Экологиялық хабардарлық деңгейлерін бағалау: жаңа көп өлшемді тұжырымдамалық негіз

Экологиялық хабардарлық деңгейін бағалау, әсіресе, Арал теңізінен су тапшылығы мәселелеріне дейінгі әртүрлі экологиялық проблемаларды шешу үшін күресіп келген және әлі де күресіп жатқан Қазақстан сияқты дамушы ел үшін экологиялық хабардарлықты зерттеуде өте маңызды. Көптеген ғалымдар ауа мен судың ластануы сияқты экологиялық проблемалардың ерекше аспектілерін қарастырғанымен, жергілікті қазақстандық ғалымдардың жалпы халық арасында экологиялық хабардарлық деңгейін шешу бойынша жұмыс көлемі шектеулі. Бұл жұмыстың зерттеу мақсаты экологиялық хабардарлық деңгейлерін бағалаудың жаңа тұжырымдамалық негізін ұсыну болды. Ол төрт негізгі өлшемнен тұрды: когнитивтік, аффективті, альтруистік және конативті өлшем, олар үшін келесі өлшемдердің әрқайсысы әртүрлі зерттеу құралдары енгізілген. Ол үшін еңбекте батыс ғалымдарының еңбектерінің теориялық негіздері мен тұжырымдамалары жан-жақты зерттеліп, үлгіленіп, қайта қолданылды. Бұл зерттеудің мақсаты – Қазақстандағы жалпы халықтың экологиялық хабардарлық деңгейін бағалаудағы тұжырымдамалық негіздердің жоқтығына қатысты зерттеу олқылығын толтыру. Осы жұмыстан алынған нәтижелер жаңа көп өлшемді құрылымды енгізу және Қазақстан контекстінде болашақ академиялық зерттеулер үшін үш жаңа зерттеу құралын қолдану мүмкіндігі болды. Бұл жаңа зерттеу құралдары 15 элементтен тұратын EEV шкаласы үлгісін, 26 элементтен тұратын экологиялық тәуекелді қабылдау шкаласы үлгісін және 18 элементтен тұратын EAS моделін қамтиды. Бұл мақала зерттеушілерге Қазақстандағы әртүрлі үлгідегі популяциялардың экологиялық құндылықтарындағы, сенімдеріндегі, алаңдаушылықтары мен қабылдауларындағы айырмашылықтарды анықтау үшін өте құнды зерттеу құралдарын ұсынды.

Түйін сөздер: Қазақстан; экологиялық сана; тұжырымдамалық негіз; бағалау өлшемдері.

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Оценка уровней экологической осведомленности: новая многомерная концептуальная основа

Оценка уровня экологической осведомленности чрезвычайно важна для исследований экологической осведомленности, особенно для такой развивающейся страны, как Казахстан, которая боролась и все еще пытается решить различные экологические проблемы, начиная от Аральского моря и заканчивая дефицита воды. Хотя многие ученые обращались к конкретным аспектам экологических проблем, таким как загрязнение воздуха и воды, работа местных казахстанских ученых по повышению уровня экологической осведомленности среди населения в целом ограничена. Целью исследования этой статьи было предложить новую концептуальную основу для оценки уровня экологической осведомленности. Он состоял из четырех основных измерений: когнитивного, аффективного, альтруистического и конативного измерения, для каждого из следующих измерений были представлены различные исследовательские инструменты. Для этого в статье были тщательно исследованы, воспроизведены и повторно применены теоретические основы и концепции работ западных ученых. Целью данного исследования является восполнение пробела в исследовании отсутствия концептуальных рамок в оценке уровня экологической осведомленности населения в Казахстане. Результатами, полученными в этой статье, стали введение новой многомерной структуры и применимость трех новых исследовательских инструментов для будущих академических исследований в контексте Казахстана. Эти новые инструменты исследования включали в себя масштабную модель EEV из 15 пунктов, модель шкалы восприятия экологического риска из 26 пунктов и модель EAS из 18 пунктов. Этот документ предоставил исследователям чрезвычайно ценные исследовательские инструменты для выявления различий в экологических ценностях, убеждениях, проблемах и восприятии различных выборочных групп населения в Казахстане.

Ключевые слова: Казахстан; экологическое сознание; концептуальная основа; параметры оценки.

Introduction

The usage of conceptual frameworks is an important aspect in the conduct of research in any field of study. It is an analytical tool that conceptually organizes main research ideas and simplifies for the reader the core aspects of the research topic and the author's research objectives. Such applications of conceptual frameworks are of special importance in exploratory and qualitative studies, such as in assessing the level of environmental awareness in a given context and group of population.

The study on ecological awareness concerns itself with the degree of awareness for the environment and its constituent complex interrelationship with the physical, biotic, chemical and anthropogenic factors. It is especially crucial not only for the government's in developing, facilitating and researching how to organize natural resource management policies and general pro-environmental programs, but also for local and international scholars in identifying the state of the public's concern and attitude towards environmental problems in the local and global context.

Kazakhstan is plagued by various environmental problems as outlined by many local and international academics, the study on environmental awareness aspects is a crucial sub-area that needs a considerably huge research attention by local scholars. Thus, a proposal for a new conceptual framework does not only enlighten the public and scholars on new ways and methods to approach ecological awareness study from a different angle, it also enriches the local academic community in the need to address social and environmental issues. Hence, providing new knowledge to the existent research gap as well as extend the research tools for better use and greater outreach to other unexplored research areas.

Environmental Awareness Study

Global Context

The theme of ecological awareness deals with the issue of general state of awareness of the public for environmental problems in the context of a specific locality, region or of global nature [1]. Hence, ecological awareness can be regarded as a social concept. In other words, ecological awareness

as a social concept deals with not only the nature and the environment itself, but also the way how it affects the people surrounding it and implications of anthropogenic activities. Other scholars defined ecological awareness as not only the state of people being aware of environmental issues in their country as well as globally, but also as the degree of being knowledgeable about specific environmental aspects [2, 3]; degree of perception, attitude, values and skills constituting people's environmental attitude [4, 5]; and as the state of individual's proper perception of how negative anthropogenic effects affect both the environment and humans [6].

The first environmental awareness movements have originated back during the times of the early 1960's and 1970's in Western societies [1]. Back in those days, the first environmentalist movements have begun as specific scientific niche and turned over time into a more active political movement [7]. Despite that, the environmentalist movement in the Western hemisphere has not translated directly to other continents of the world, which as a result has brought disproportional level of developments and progresses in environmental movements and scientific study [7]. In the early years of its scientific studies, the focus was in studying environmental awareness was mainly concerned with aspects of traditional attitude as well as socio-psychological variables of pro-environmental behavior [8]. However, by the beginning of the 1990's, the focus has shifted towards studying other variables and pro-environmental values [8]. For instance, these included studies regarding the pro-environmental values such as the role of sustainable development in addressing ecological awareness issues [9, 10], usage of different variables such as of knowledge [1, 10] [11], and other determinants of ecological attitude and behavior [7] [12-14].

Nowadays, the study of environmental awareness aspects has been studied and is being studied through many lenses. For instance, some scholars approached it from the perspective of consumer-related themes and how environmental awareness affected the consumption patterns [15, 16]; perspective of how environmental pollution impacts on health affected environmental awareness aspects [17-19] as well as in relation to how it affected the development of environmental education worldwide [20-22].

Context of Kazakhstan

The study of ecological awareness can be considered as somewhat a new research niche in the research context of Kazakhstan. In Kazakhstan, ecological awareness problems have been addressed

not only by the government and numerous local and international scholars in the context of institutional frameworks of a green economy [23], Aral Sea Problem [24-26] and air pollution [27, 28], but also by international organizations such as the UNECE [29, 30], UNDP [31], OECD [32] or the WHO [33, 34]. For instance, the project launched in 2020 by the UNDP with the objective of assessing the public perception of different Kazakhstani populations on climate change aspects have shown in their survey results that air and water pollution were one of the most detrimental environmental issues that needed to be effectively addressed by both the government and civil society organizations [31]. Besides that, the survey also provided new findings on how well people themselves were aware of government-initiated pro-environmental programs [17]. According to the survey results, 62% of respondents were unaware of government-led projects in battling climate change, meaning that most people were not aware of how environmental problems were fought on the governmental level [17].

Likewise, the UNECE have concluded in their annual release of environmental performance review reports that Kazakhstan significantly lacked valuable research data and reliable information portals available for researchers in order to assess and analyze the level of environmental awareness aspects in the country [29, 30]. Even back in 2000, the UNECE has reported the low level of public awareness for environmental issues in the country [29]. This statement has been also supported by the Central Asian Analytical Network (CAAN) in 2018 [35]. Here, the CAAN stated that the country's level of environmental literacy still remains low in terms of waste management matters and air pollution aspects [35]. Moreover, considering that issues such as the Aral Sea problem alongside the increase of human health costs due to air pollution in areas of industrial regions such as Karaganda, Temirtau and Almaty have adversely affected both the Kazakhstani society and the surrounding environment [24-28], it is worth to saying that more studies on environmental problems in the country are being published.

Despite that, the scope of the research study has not grown to become a niche that attracts a lot of young scholars to do research in that specific area of study. In fact, only a limited number of local and international scholars have addressed environmental problems in Kazakhstan, and not many of them addressed the issue of lack of conceptual frameworks in studying environmental awareness levels. For

instance, most local Kazakhstani scholars focused on studying the process of ecological education in the context of environmental awareness [36-38]. Here, one author analyzed the student's ecological awareness development on geography lessons in the Republic of Kazakhstan [37], while the other looked at how the level of environmental consciousness has been affected in preschool and primary schools in the country [38]. According to the study done by Yessenamanova et al., it has been concluded that the effectiveness and role of school education in the formation of environmental awareness is still very low in the country [38].

Other local scholars focused on approaching it from a more practical case studies on different local environmental issues [39-43]. For instance, one international scholar assessed the level of public awareness for how general waste management is being managed in the city of Nur-Sultan [39]. According to their analysis, the overall level of environmental awareness for general waste management has risen and people are becoming more aware about the way how sort out their waste [39]. Another section of scholars looked at the household solid waste matters in the country [40, 42]; the media as a tool for forming public consciousness on ecological problems in the country [44]; or how civil society organizations in Kazakhstan have played and still play a crucial role in propagating new environmental laws and driving pro-environmental awareness movements [45, 46].

However, only three local scholars [47-49] proposed some form of conceptual frameworks for assessing environmental awareness aspects from different angles as well as with different components. While one local scholar proposed a conceptual framework of environmental consciousness by referring to Russian scholarly theoretical concepts [49], another scholar proposed a pedagogical model to assess pre-University students level of ecological consciousness [49]. Therefore, it is safe to say that there exists a significant research gap concerning proposals of conceptual frameworks for assessing ecological awareness levels in Kazakhstan.

Research Method & Objective

Conceptual frameworks are defined as the description, either in the form of graphical representation or narrative form, of the main things that are to be studied [50]. This includes the depiction of how variables such as dependent or independent variables are used as well as how they are linked

with one another [50]. Others defined the practice of conceptual frameworks as the 'idea context' of beliefs and ideas of research [51].

The research method that is applied in this paper is of a qualitative nature with the use of a descriptive research methodology, where three main research tools of EEV Scale Model, Environmental Risk Perception Scale Model and the EAS Model were thoroughly introduced and presented as new research instrument tools usable for assessing an individual's ecological awareness level. Prior to that, an extensive research of four prominent conceptual frameworks was conducted in order to understand what components and dimensions an assessment of ecological awareness consists of [52-55].

The research objective of this paper is to introduce a reliable and viable new conceptual framework that can be used by local Kazakhstani scholars by combining several scale measurements and conceptual frameworks from different international scholarly works. Thus, this research novelty fills the gap of the lack of conceptual frameworks in analyzing the ecological awareness levels in a given country with four different levels of dimensions.

Content of Conceptual Framework

Having extensively reviewed the conceptual frameworks offered by the four aforementioned prominent Western scholars and their concepts, theories as well as the way how they conceptualized their main ideas, this paper developed a more complex and multi-dimensional theoretical framework in order to assess an individual's ecological awareness levels. The proposed multi-dimensional conceptual framework consists of four main components with their respective four dimensions (cognitive, affective, altruistic and conative dimension) that make up an individual's level of ecological awareness (Figure 1). These four dimensions were emulated from the 2012 study on «Measurement and categorization of environmental awareness in university students: the contribution of the University to strengthening it» [55].

The first component focuses on the level of an individual's environmental knowledge, which represents the cognitive dimension (Figure 1). By cognitive dimension we refer to the mental action or process of acquiring knowledge.

The second component focuses on the individual's environmental values and beliefs, which represents the affective dimension (Figure 1). Here, by affective dimension we refer to the ability of an individual to make inference about emotions and feelings.

The third component revolves around an individual's environmental concern and altruism aspects, which represent the altruistic dimension (Figure 1). This dimension deals with the person's behavior and attitude of unselfish concern for others besides himself or herself. In other words, altruism is the moral principle or practice of caring for others and showing concern about one's own action to others or to something.

Last but not the least, the fourth component centers around the aspects of environmental activism, behavior and attitude, which represents the conative dimension (Figure 1). Here, the focus is on the degree of environmental activism of an individual towards environmental problems on a local or global scale.

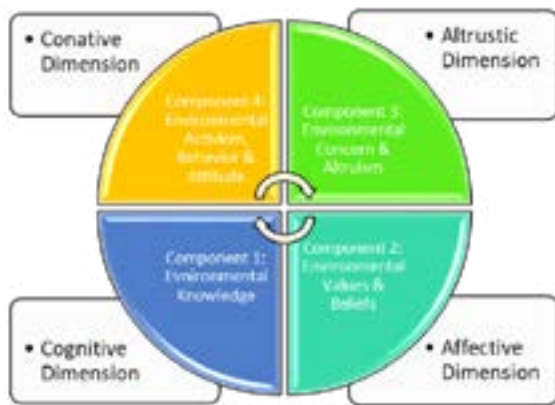


Figure 1 – Multi-Dimensional Conceptual Framework

Measurement Application Tools

Each one of the four components as outlined above, can be analyzed with different and specific research tools. For the first component, since environmental knowledge is rather a subjective and contextually dependent aspect, it is advisable to self-administer and self-construct a specific scale measurement with its own context-specific questionnaire items. However, an own scale measurement with specific items can be reproduced depending on the context where the research instrument assessing environmental knowledge is being applied.

1. *EEV Scale Model*

In order to analyze the second component concerning ecological values and beliefs, here the so-called 15-item EEV (Expanded Ecological Values) Scale Model can be applied with a five-point Likert-type scale measurement, which has already been used in previous studies such as in the context of New Zealand [56]. This particular 15-item EEV scale research tool was initially developed by Dunlap with only 6 items, but has been extended with an additional 9 items throughout the years afterwards [57]. The results of the 15 items of the EEV Model are categorized into the following three sub-groups: Anti-ecological, mid-ecological and pro-ecological [56]. The following three tables represent the 15 item statement of the EEV Scale Model (Table 1), scale measurement (Table 2), and categorization of scale measurement (Table 3).

Table 1 – 15 item statements of EEV Scale Model

Category	Item Statement
Balance	1. The balance of nature is very delicate and easily upset.
Eco-Crisis	2. Modifying the environment for human use seldom causes serious problems.
Domination of humans over nature	3. Plants and animals exist primarily to be used by humans.
Limits to growth	4. The Earth is like a spaceship with only limited room and resources.
Limits to growth	5. There are limits to economic growth even for developing countries like ours.
Domination of humans over nature	6. Humans were meant to rule over the rest of nature.
Social Justice	7. Present generations of humans have no moral duties and obligations to future human generations.
Eco-crisis	8. The so-called 'ecological crisis' facing humankind has been greatly exaggerated.
Environmental regulation	9. We must take stronger measures to conserve our nation's resources.
Duties to non-humans	10. Humans have moral duties and obligations to other animal species.
Environmental regulation	11. Environmental regulations have placed unfair burdens on industry.
Social Justice	12. Natural resources should be used primarily to provide for basic needs rather than material wealth.

Category	Item Statement
Domination of humans over nature	13. Humans have the right to alter nature to satisfy wants and desires.
Duties to non-humans	14. Nature is valuable for its own sake.
Limits to growth	15. Humans live on a planet with limited room and resources.

In Table 1, the EEV Scale Model consists of 15 items and consists of seven different categories. Each of these items are measured according to the 5-Point Likert-type Scale with «strongly agree» receiving 5 points and «strongly disagree» receiving 1 point only as depicted in Table 2 below.

Table 2 – Scale Measurement of the 15-item EEV Scale Model

Scale Measurement	Score Points
Strongly Agree	5
Agree	4
Neither agree nor disagree	3
Disagree	2
Strongly Disagree	1

Table 3 – Group Categorization of Scale Measurement

Scoring Group	Total Score Range
Anti-ecological	15-45 score points
Mid-ecological	46-60 score points
Pro-ecological	61-75 score points

Table 3 depicts the score categorization according to three scoring groups: anti-ecological, mid-ecological and pro-ecological. While the former categorization of anti-ecological has been

assessed to be within the range of 15-45 score points, the following mid-ecological categorization is within the scoring range from 46-60. The latter categorization of pro-ecological is assessed to be within the scoring range of 61-75 score points.

2. Environmental Risk Perception Scale

For the second component, an environmental risk perception scale can be applied, which would enable scholars to assess the degree to which one perceives environmental danger to the community or individual. Such research measurement tool may include those proposed by Walsh-Daneshmandi & MacLachlan [58]. Here, the degree of environmental risk perception towards specific environmental problems can be measured according to a 26-item environmental risk perception scale [58]. For that a 7-Point Likert-type Scale (1 = no threat, 7 = extreme threat) could be applied [58]. The following three tables represent the 26 items (Table 4), item categorization (Table 5), and scale measurement (Table 6).

In Table 4, the lists of the 26 items pertaining to the Environmental Risk Perception Scale Model are presented. It consists of 13 items related to industrial and anthropogenic risks; 4 items related to natural disaster risks; and 9 items related to everyday life risks as illustrated in Table 5 below. All these 26 environmental risk items are assessed according to a 7-Point Likert-type Scale Measurement with «no threat» being given as 1 point and «extreme threat» as 7 points. This is illustrated in Table 6.

Table 4 – 26 items of Environmental Risk Perception Scale

Item	Item Name
1 st item	General water and air pollution
2 nd item	Fauna Endangerment (e.g. risks associated with native animal species and vulnerable habitats)
3 rd item	Pollution from cars, factories and burning trash
4 th item	Smoking in public buildings
5 th item	Acid rain
6 th item	Number of people – crowding, overpopulation
7 th item	Visual pollution – littering, landfills, smog, fumes or plastic pollution

Item	Item Name
8 th item	Forest cutting
9 th item	Changes to the ozone layer caused by pollution
10 th item	Soil Erosion
11 th item	Impure Drinking Water
12 th item	Forest Fires
13 th item	Floods or tidal waves
14 th item	Germs or micro-organisms
15 th item	Radioactive fallout and contamination
16 th item	Climate Change Impact (e.g. increased wildfires, declining water supplies, reduced agric. yield, land erosion, flooding)
17 th item	Pesticides and Herbicides
18 th item	Biodiversity loss & ecosystem collapse (habitat loss, invasive species, pollution, overexploitation or climate change)
19 th item	Surface water contamination from discarded motor oil
20 th item	Air pollution from waste to energy incinerators
21 st item	Sea and lake pollution from dumping municipal solid waste
22 nd item	Chemical dumps
23 rd item	Water shortage (e.g. drought, water depletion)
24 th item	Earthquakes
25 th item	Radio-frequency radiation exposure from cellphones
26 th item	Storage of radioactive waste

Table 5 – Categorization of the 26 items of Environmental Risk Perception Scale

Risk Categorization	Item Numbers
Industrial & Anthropogenic Risks (13 items)	1, 2, 5, 8, 9, 15, 16, 17, 18, 19, 21, 22, 26
Natural Disaster Risks (4 items)	10, 12, 13, 24
Everyday Life Risks (9 items)	3, 4, 6, 7, 11, 14, 20, 23, 25

Table 6 – Scale Measurement of Environmental Risk Perception Scale

Scale Measurement	Scale Points
No Threat	1
Minimal Threat	2
Mild Threat	3
Moderate Threat	4
Strong Threat	5
Very Strong Threat	6
Extreme Threat	7

3. EAS Model

And lastly for the fourth component, an EAS (Environmental Action Scale) Model with its 18-items developed by Alisat & Riemer can be used in order to measure the level of environmental activism, behavior and attitude [59]. Both scholars have tested it out previously among North American University students [59]. Here, the 18 items would be rated on a 5-point Likert-type scale ranging from 0 (never) through 2 (sometimes) to 5 (very frequently) [59]. The items are sub-divided into two groups: participatory action and leadership action [59]. The following 4 tables show the 18 items of EAS Model (Table 7), item categorization (Table 8), scale measurement (Table 9), and categorization of scale measurement (Table 10).

The EAS Model consists of 18 items (Figure 7), of which 10 items pertain to the participatory action sub-group and the other eight into the leadership action sub-group as illustrated in Table 8. Each of these 18 items are measured according to a 6-Point Likert-type Scale Measurement from 0 (Never) to 5 (Very Frequently) (Table 9).

Moreover, the scale scores are categorized into three sub-groups: low-ecological activist level (0-30 score range), middle ecological activist level (30-60 score range), and high ecological activist level (60-90 score range). This is illustrated in Table 10 below.

Table 7 – 18 items of EAS Model

Item	Item Name
1 st item	Educated myself about environmental issues (e.g. through media, television, internet, blogs, etc.)
2 nd item	Participated in an educational event (e.g. workshop) related to the environment.
3 rd item	Organized an educational event (e.g. workshop) related to environmental issues.
4 th item	Talked with others about environmental issues (e.g., spouse, partner, parent(s), children, or friends).
5 th item	Used online tools (e.g., YouTube, Facebook, Wikipedia) to raise awareness about environmental issues.
6 th item	Used traditional methods (e.g., letters to the editor, articles) to raise awareness about environmental issues.
7 th item	Personally wrote to or called a politician or government official about an environmental issue.
8 th item	Became involved with an environmental group or political party (e.g., volunteer, summer job, etc.).
9 th item	Financially supported an environmental cause.
10 th item	Took part in a protest/rally about an environmental issue.
11 th item	Organized an environmental protest/rally.
12 th item	Organized a boycott against a company engaging in environmentally harmful practices.
13 th item	Organized a petition (including online petitions) for an environmental cause.
14 th item	Consciously made time to be able to work on environmental issues (e.g., working part time to allow time for environmental pursuits, working in an environmental job, or choosing environmental activities over other leisure activities).
15 th item	Participated in a community event which focused on environmental awareness.
16 th item	Organized a community event which focused on environmental awareness.
17 th item	Participated in nature conservation efforts (e.g., planting trees, restoration of waterways).
18 th item	Spent time working with a group/organization that deals with the connection of the environment to other societal issues such as justice or poverty.

Table 8 – Categorization of the 18 items of EAS Model

Sub-Group	Item Numbers
Participatory Action	1,2,4,5,8,9,14,15,17,18
Leadership Action	3,6,7,10,11,12,13,16

Table 10 – Categorization of Scale Measurement

Score Categorization	Score Range
Low ecological activist level	0-30
Middle ecological activist level	30-60
High ecological activist level	60-90

Table 9 – Scale Measurement of EAS Model

Scale Measurement	Scale Score
Never	0
Rarely	1
Sometimes	2
Often	3
Frequently	4
Very Frequently	5

Discussion Section

This conceptual framework can be used for specific research purposes in order to analyze the level of environmental awareness among different population groups in Kazakhstan. For instance, such population groups may include University students, government employees, employees of private and national enterprises as well as marginalized groups of the society such as ethnic migrants or people

belonging to the group of NEET («Not in Education, Employment, or Training»). In this regard, it could help researchers in identifying what segments of the population are more ecologically aware or which population group are more ecologically active than others. Moreover, it could support local governments to address local waste management issues, limitations of pro-environmental campaigns and attract civil society organizations to improve on various aspects of environmental awareness concerns. Besides that, while only a handful of conceptual frameworks have been proposed by Kazakhstani scholars, there are far more research works that address specific environmental awareness aspects such as in the context of environmental education, air and water pollution, general waste and solid waste management issues, or the role of civil society organizations. Hence, by no doubt the research works will likely

Speaking of the specific aspects of each research instrument, it is worth understanding that each instrument serves its own special purpose of analysis. For instance, with the 15-item EEV Scale Model, researchers could highlight which groups of the society are anti-ecological, mid-ecological or pro-ecological in nature. Such categorization of scale measurements would simplify the data results and give us clear understanding on the degree of how ecological a person, a group or a nation is compared to another one.

With the second research instrument, the so-called Environmental Risk Perception Scale Model, researchers will be able to assess how each of the 26 environmental risk items are perceived in terms of their level of risk for the country. This would enable scholars to comprehend what kind of environmental problem are prioritized over the other for government or civil society organizations. Results from such studies could bring new insights into which environmental problems the country should focus on solving and addressing it. For instance, data results would give us an idea about if there is a need to address issues related to everyday life risks and natural disaster risks, or whether there is a need to redirect attention to industrial and anthropogenic risks.

The third research instrument of the EAS Model targets an individual's level of environmental activism, and tries to understand by categorizing it into two sub-groups of participatory and leadership action, whether a sample population is actively involved in environmental activism. Hence, it looks at the active and practical part of an individual to be

environmentally active. Such research instruments would be especially helpful for civil society organizations for pinpointing whether a sample of a population or a group of population such as the young people are actively involved in propagating environmental campaigns or being environmentally active on both the social media and other information platforms. Understanding it could prove useful also for think tanks in labeling out which regions of a country are more environmentally active than others. Thus, benefitting also the scientific community in capturing for potentially new research areas to be studied.

Conclusion

In conclusion, this paper proposed a new conceptual framework for evaluating the level of ecological awareness, which covered four main aspects of ecological awareness: cognitive, affective, conative and altruistic dimensions. While on the one hand affective and cognitive dimension dealt with environmental knowledge, values and beliefs, on the other side conative and altruistic dimensions focused on environmental activism, concern and altruistic behavior.

Moreover, this paper also provided specific research tools that could be valuable in measuring three out of the four dimensions. These included, the 15-item EEV Model [38], Environmental Risk Perception Scale Model [40], and the EAS Model [41]. With each model having its own specifications in terms of item numbers, scale measurement types and categorizations, it allows not only to enrich the researcher's availability of using various research instruments, but also gives the researcher a well-balanced tool for obtaining more reliable, concrete and accurate data results. Considering that there is a lack of data among the academic society what concerns the study of environmental awareness in the context of Kazakhstan, these three research instruments could provide useful to fill the research gap. Hence, these new measurement scales could Kazakhstani researchers use to study ecological awareness aspects more effectively as well as in a more structured manner. As a result, this paper serves as precursor of a more complete conceptual framework for analyzing ecological awareness.

Despite that, the limitation of this conceptual framework proved to be that since only three out of four dimensions were discussed in detail with for each one of them being assigned one specific research

instrument, the dimension concerning cognitive aspects need to be re-evaluated. This could help to further strengthen and enrich the multi-dimensional framework in terms of its theoretical and practical usability for assessing an individual's and public's environmental knowledge levels.

For future research purposes, it would be very interesting to look at how this conceptual framework could be extended and build upon by adding new dimensions and updated scale measurements. This could extend the use of the conceptual framework to other aspects and enrich its theoretical quality. On top of that, it is recommended that this conceptual framework should be applied to various segments

of the population to see whether it is reliable and applicable when administering it as an online survey. For instance, it would be very valuable to understand the differences in ecological awareness levels between different age generations or employment sectors. This could provide researchers with immensely valuable primary data for pinpointing differences in environmental values, beliefs, concerns, and perceptions. Thus, being beneficial for the whole research community in knowledge creation and for the civil society organizations as well as the government in developing more sophisticated, progressive and pragmatic pro-environmental public policies.

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