ECO-AWARENESS POLICY INSTRUMENTS: DEVELOPING AND EVALUATING A TAXONOMY

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Abstract. Policy instruments are used to cause societal change and achieve specific policy goals. Within eco-awareness policy context, they serve as tools to effectively address eco-education matters. While ample policy taxonomies exist for environmental concerns as air pollution or eco-education, no comprehensive eco-awareness-related taxonomy exist for Kazakhstan's context. Therefore, in line with this research gap, this paper attempts to construct the first eco-awareness-based policy taxonomy. For that, 20 eco-awareness-based academic papers are analyzed, and 30 Kazakhstani eco-experts invited to assess thoroughly each policy instrument's compatibility as an eco-awareness-raising tool. Finally, each PI is then assessed according to nine assessment indicators ranging from legitimacy and transparency to equity and effectiveness. According to the expert's analysis results, public awareness campaign and direct state provision policy types topped the list among all nine indicators. Here, nationwide public cleaning quests and training of eco-experts and eco-journalists were considered as the most effective, well-enforced, and socio-politically legitimate. The results obtained are extremely valuable for local environmental policy makers, who could further refine and extend the taxonomy.
Keywords: policy instruments; policy taxonomy; assessment indicators; eco-awareness policies.

Аңдатпа. Саясат құралдары қоғамды өзгерту және нақты саясат мақсаттарына жету үшін қолданылады. Экологиялық хабардар болу саясаты контекстінде олар экологиялық білім беру мәселелерін тиімді шешу құралы ретінде қызмет етеді. Ауаның ластануы немесе экологиялық білім беру сияқты экологиялық мәселелерге қатысты көптеген саясат таксономиялары бар болса да, Қазақстан контекстінде экологиялық хабардарлыққа қатысты кешенді таксономия жоқ. Сондықтан, осы зерттеу олқылығына сәйкес, бұл жұмыс эко-санаға негізделген алғашқы саясат таксономиясын құруға тырысады. Ол үшін экологиялық хабардарлыққа негізделген 20 академиялық мақалалар талданады және 30 қазақстандық эко-сарапшылар әрбір саясат құралының экологиялық хабардарлықты арттыру құралы ретінде үйлесімділігін мұқият бағалауға шақырылады. Соңында, әрбір PI заңдылық пен ашықтықтан әділдік пен тиімділікке дейінгі тоғыз бағалау көрсеткіші бойынша бағаланады. Сарапшының талдау нәтижелері бойынша барлық тоғыз көрсеткіштің ішінде халықты түсіндіру жұмыстары мен тікелей мемлекеттік қамтамасыз ету саясаты түрлері көш бастады. Мұнда жалпыұлттық тазалық квесттері мен экосарапшылар мен экожурналистерді оқыту ең тиімді, жақсы орындалған және қоғамдық-саяси тұрғыдан заңды деп танылды. Алынған нәтижелер таксономияны одан әрі нақтылап, кеңейте алатын жергілікті экологиялық саясаткерлер үшін өте құнды.
Түйін сөздер: саясат құралдары; саясат таксономиясы; бағалау көрсеткіштері; экологиялық ақпараттандыру саясаты

Аннотация. Инструменты политики используются для того, чтобы вызывать общественные изменения и достигать конкретных политических целей. В контексте политики экологической осведомленности они служат инструментами для эффективного решения вопросов экологического образования. Хотя для экологических проблем, таких как загрязнение воздуха или экологическое образование, существует достаточно таксономий политики, для контекста Казахстана не существует комплексной таксономии, связанной с экологической осведомленностью. Поэтому, в соответствии с этим исследовательским пробелом, в этой статье делается попытка построить первую таксономию политики, основанную на экологической осведомленности. Для этого анализируются 20 научных работ, основанных

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на экологической осведомленности, и приглашаются 30 казахстанских экологических экспертов для тщательной оценки совместимости каждого инструмента политики в качестве инструмента повышения экологической осведомленности. Наконец, каждый PI затем оценивается по девяти показателям оценки, начиная от легитимности и прозрачности и заканчивая справедливостью и эффективностью. Согласно результатам анализа эксперта, кампании по повышению осведомленности общественности и типы политики прямого государственного обеспечения возглавляют список среди всех девяти показателей. Здесь общенациональные общественные уборочные квесты и обучение эко-экспертов и эко-журналистов были признаны наиболее эффективными, хорошо реализуемыми и социально-политически легитимными. Полученные результаты чрезвычайно ценны для местных разработчиков экологической политики, которые могли бы дополнительно уточнить и расширить таксономию.
Ключевые слова: политические инструменты; таксономия политики; индикаторы оценки; политика экологической осведомленности

Introduction

Globally, environmental issues became an both an important media theme and an integral part of country's national policy agenda. Nowadays, governments use various environmental policy instruments (PIs) to tackle countless environmental issues ranging from climate change to air pollution. One of the more overlooked environmental issues concern eco-awareness aspects. While in most Western countries this problem is addressed via complex eco-public campaigns and environmental education (EE) policies, in Kazakhstan it is under-developed and under-researched. While studies on general environmental policies are ample, no comprehensive eco-awareness-related PI taxonomy has yet been constructed.

Therefore, considering the existent research gap, a new eco-awareness-raising PI taxonomy is constructed. For that, twenty environmental PI-related academic papers are analysed and then thoroughly examined by thirty Kazakhstani eco-experts to refine design relevant and viable eco-awareness PIs. Afterwards, each PI is assessed based on nine specific assessment indicators. Structurally, the paper is divided into several parts. First, a literature review on the topic of PIs is provided, where its definition, origin, types, research and practical importance, and research progress in Kazakhstan are discussed. Then, having outlined both the research objectives and methodology, the results of the assessment of the nine eco-indicators and the full eco-awareness PI taxonomy are presented. Lastly, specific PI examples from each of the six PI types are thoroughly discussed by critically examining their policy developments and policy implications.

Literature Review

Definition. PIs are considered a set of techniques used by the government to achieve specific policy objectives and cause social change [1, 2]. Here, PIs are often used to simplify the policy processes in such a way that it is easier to understand it [2]. Others use PIs to explain policy change dynamics [3]; to support or amend existent policies to make them more robust, effective, and complex [4]; or as means of government intervention to reach targeted specific policy goals [2, 3, 4, 5]. Often, these PIs may come in various forms, as political, socio-economic, or administrative. Generally, two PI types exist: (1) PIs designed to influence the society (external influence); and (2) PIs focusing on changes of administrative actors (internal influence) (e.g., personnel-related, or organization-focused) [1]. In public policy studies, the PIs are often studied in public intervention discourse by public authorities [1]. Nowadays, the study of PIs is considered an important pillar in public policy analysis, particularly applied in policy-making process, policy dynamics, policy effectiveness, and policy design [6].

PIs Origin.Scholars were studying PIs since 1970s, with earliest applications found in economics and government intervention studies [5]. The importance of industrialization process in countries as Japan, USA, or Finland in 1960s were seen as catalysers of policy change [7]. Generally, the study of PIs can be divided into three different research periods. In the first period (1970-1985), the command-and-control and top-down policy approaches were introduced [5]. Then, the second research period (1985-1995) emerged with research focus shifting towards constructing PIs that fit the appropriate policy problem [5].

Finally, since the 1990s, the so-called information-disclosure and cooperation-mechanism approach emerged, focusing on policy implementation and governance-related principles [5]. Nowadays, PIs are studied in many research niches, as public management, public policy implementation, or ecology [8].

PI Types

The study on different types of PIs is well documented in the academia. Generally, most PI classifications can be divided into three main types: regulatory, economic, and informational. Prominent scholars who proposed such classifications are more than plenty [e.g., 1, 2, 9, 10, 11, 12].First, use of prohibitions or enforcement of regulations exercised by authoritative bodies are regulative examples [1, 2, 5, 11]. Second, use of negative (e.g., taxes/charges) and positive incentives (e.g., grants/subsidies) to achieve desired behavioural changes are economic examples [3, 5, 13]. Lastly, use of communicative tools to increase societal informational knowledge are information-based tools [5, 11, 12, 14, 15). Others provided other classifications. For instance, Bragadottir et al. structured into economic, administrative, informational, and research-oriented types [16]. Another typology divided typologies based on environmental education tools, namely formal and non-formal education and use of communication measures [17, 18].

Research Context in Kazakhstan

In Kazakhstan, numerous papers approached environmental PIs from different perspectives. While one scholar studied waste and air pollution management [19], others studied EE policy strategies of non-governmental organizations (NGOs) [20], or modern regulatory challenges involving public's access to environmental information [21, 22, 23]. Nevertheless, only a handful of papers studied PIs from an eco-awareness-related perspective. For example, one group of scholars discussed both successes and challenges of Kazakhstani EE policies [24, 25]. Others discussed past and current regulative challenges of local eco-journalists [26, 27]. Lastly, another paper designed a PI taxonomy pertaining to green economy aspects based on classifications related to financial, institutional, informational, and social measures [28]. Hence, considering this research gap, our paper will attempt to construct and assess a new eco-awareness-related PI taxonomy.

Research & Practical Importance

There are ample reasons for why studying PIs is crucial for researchers and policy makers. First, it allows to simplify the complex reality of policy-making process. Consequently, making policies more predictable, easier to measure, and enable incorporating more effectively policy adjustments.

Second, the classification of PIs also helps policy makers easier to understand how and why policy dynamics change or develop in the way they do. Governments need to adapt their implemented environmental policies continuously to new policy realities, as the dynamics of environmental politics may change rapidly due to legislative changes, presence of new and disappearance of old policy problems, lack or abundance of administrative resources, or emergence of new governance principles.

Research Objectives & Methodology

Overall, this study has two main research objectives. First, to present a comprehensive taxonomy list of EE-related PIs, which were synthesized from various environmental PI-related academic papers. Since PI taxonomies addressing EE are scarce in Kazakhstan with some PIs being scattered within the New Environmental Code (NEC), articles, or official state reports, it would serve as the first practical blueprint that is usable and refinable. And second, to assess each PI based on nine eco-assessment indicators. The analysis results would be immensely crucial for our local policy makers with its practical and theoretical significance.To create a new typology of eco-awareness-related PIs, this study has conducted first a content analysis of 20 environmental PI taxonomies from various academic articles, with each source providing their own unique list of PIs (see Table 2). Only specific PI examples were selected that were relevant to eco-awareness aspects. After having outlined the full list, information concerning the PI's academic source and their reference within the NEC were provided.

Next, after having compiled a preliminary list of 35 eco-awareness PIs, the total list was sent out to 30 Kazakhstani eco-experts for a thorough review process that were conducted via a Zoom online interview. Among the respondents, only five represented the Ministry of Ecology and Natural Resources (MENR) with the rest representing environmental NGOs. The eco-experts assessed each of the 35 PI's relevance to eco-awareness policy area. The respondents were selected based on a convenience sampling method on the networking site *Linkedin*. Based on the eco-expert's recommendations, the final 35 PI item taxonomy was constructed (see Tables 3 to 7). The following nine eco-assessment indicators were used: (1) legitimacy (LE); (2) transparency (TR); (3) equity (EQ);

(4) eco-effectiveness (EF); (5) administrative feasibility (AF); (6) political acceptability (PA); (7) adaptability (AD); (8) positive social impact (PSI); (9) enforcement (EN) (see Table 1). Here, five indicators were retrieved by Mickwitz [7] and three by UNEP [4], while the indicator regarding 'PSI' was self-constructed. For each eco-assessment indicator, its academic source, criteria group, description, and scale measurements were provided. Each PI was assessed from a scale score of 1 (low-level), 2 (middle-level) to 3 (high-level). After the assessment procedure, each PI's average scale score was calculated and discussed.

Table 1. Description and explanation of the nine PI eco-assessment indicators

*Note: HL = High Level; ML = Moderate Level; LL = Low Level.

Criteria	Academic Source	Group	Related Question/Description	Scale Score Responses	Scale Score Response Range
Legitimacy	Mickwitz [7]	Democracy	To what extent do citizens & organizations accept PI?	3: HL Legitimacy 2: ML Legitimacy 1: LL Legitimacy	0-1: LL Legitimacy 1-2: ML Legitimacy 2-3: HL Legitimacy
Transparency	Mickwitz [7]	Democracy	In what way are outcomes, outputs, and processes used in implementation of PI publicly observable?	3: HL Transparency 2: ML Transparency 1: LL Transparency	0-1: LL Transparency 1-2: ML Transparency 2-3: HL Transparency
Equity	Mickwitz [7]	Democracy	Do all participants have equal opportunities to participate and influence in implementation process?	3: HL Equity 2: ML Equity 1: LL Equity	0-1: LL Equity 1-2: ML Equity 2-3: HL Equity
Eco-effectiveness	Mickwitz [7]	Performance	To what degree do achieved outcomes correspond to intended goals of PI?	3: HL Effectiveness 2: ML Effectiveness 1: LL Effectiveness	0-1: LL Effectiveness 1-2: ML Effectiveness 2-3: HL Effectiveness
Administrative Feasibility	UNEP [4]	Politico-administrative	Is PI technically feasible in the institutional and administrative context? Are processes easy to understand? Does PI require minimum monitoring & enforcement costs?	3: HL Feasibility 2: ML Feasibility 1: LL Feasibility	0-1: LL Feasibility 1-2: ML Feasibility 2-3: HL Feasibility
Political Acceptability	UNEP [4]	Politico-administrative	Degree of PI political support.	3: HL Acceptability 2: ML Acceptability 1: LL Acceptability	0-1: LL Acceptability 1-2: ML Acceptability 2-3: HL Acceptability
Adaptability	Mickwitz [7]	Adaptiveness	How well PI copes with changing conditions (e.g., technological progress & social pressure).	3: HL Adaptability 2: ML Adaptability 1: LL Adaptability	0-1: LL Adaptability 1-2: ML Adaptability 2-3: HL Adaptability
Positive Social Impact	Self-constructed	Social	Has PI caused a significant positive social change in developing higher eco-awareness levels?	3: HL Social Impact 2: ML Social Impact 1: LL Social Impact	0-1: LL Social Impact 1-2: ML Social Impact 2-3: HL Social Impact
Enforcement	UNEP [4]	Legal	Degree on how well PI is legislatively enforced.	3: HL Enforcement 2: ML Enforcement 1: LL Enforcement	0-1: LL Enforcement 1-2: ML Enforcement 2-3: HL Enforcement

Note: The table was compiled by the authors based on sources [4,7].

Table 2. List of academic sources used to create eco-awareness-raising PIs

Item	Academic Source	Taxonomy of PIs
1	Vedung et al. [1]	regulation; market-interventions; information.
2	OECD (2004) (in Roshandel et al. [29])	regulation; market-use; public participation.
3	Coria & Sterner [11]	eco-regulations; market-use; public engagement; direct provision; macro-economic policies.
4	OECD [13]	eco-taxes; fees/charges; tradable permits; deposit-refund systems (DRS); subsidies; voluntary approaches.
5	Böcher & Töller [10]	regulative; market-based; procedural; co-operative; persuasive.
6	Youth and Environment Europe [30]	EE; field trips; cleaning quests; feel-nature activities; shared treasure map.
7	Salafksy et al. [17]	formal/non-formal education; communication measures.
8	Ballard et al. [18]	classroom visits (lectures/presentations); camps/field trips; project-based learning; inquiry-based and hands-on activities; community engagement.
9	Oz & Esgunoglu [31]	custom solutions; market-based; command-and-control.
10	Knill et al. [3]	obligatory standard; prohibition; technological prescription; taxation/levy; subsidies; liability scheme; public investments; data collection/monitoring programs; permits.
11	MENR [12]	EE; information-campaign; regulatory; market-based.
12	Huppes & Simonis [2]	political-administrative; regulatory; social.
13	Thorsen et al. [32]	command-and-control; economic; information & education.
14	Monroe et al. [33]	convey information; build understanding; improve skills; enable sustainable actions.
15	Hamilton et al. [9]	market-use; eco-regulation; public engagement.
16	Persson (2007) [15])	information-based; incentive-based; directive-based regulation.
17	Bragadottir et al. [16]	economic; administrative; informational; research.
18	UNEP [4]	command-and-control; innovation-oriented; economic incentives; etc.
19	Moore [34]	motivational; financial; market-based; self-regulatory; regulatory.
20	Partanen-Hertell et al. [14]	economic-based; regulatory-oriented; information-based.

Research Results & Analysis

Eco-awareness PI Taxonomy

Next, the final eco-awareness PI taxonomy based on the thirty Kazakhstani eco-expert's recommendations is presented. Note that the following abbreviations are used: RE = regulative; MB= market-based; PAC = public awareness campaign; PR = procedural; EE = eco-education; DSP = direct state provision; M = missing.

Table 3. Five RE PIs & Six MB PIs

Item & Type	PIs	Academic Source (see references)	NEC Article
1 (RE)	Developing efficient state-enforcement system inspecting compliance of eco-awareness-raising legislations to national and international laws (e.g., Aarhus Convention (AC))	2; 11; 28.	M
2 (RE)	Developing state eco-awareness-raising policy monitoring system covering eco-safety, EE process, SD goals, ecosystem services, etc.	M	159
3 (RE)	Adopting AC-related legal novelties improving eco-journalist's rights.	26.	M
4 (RE)	Introducing enforcement and assessment mechanisms for use of stringent technological prescriptions, audits, and best-	3; 10; 16; 28; 31.	40 113

	available-techniques.		119
5 (RE)	Deregulating public access to sensitive EI.	2; 14; 15; 26; 27; 28; 34.	17-18 20, 192
6 (MB)	Using eco-taxes (e.g., carbon tax).	1; 3; 9; 10; 13; 15; 29; 31.	127 129
7 (MB)	Green crediting/financing mechanisms for eco-awareness-raising programs.	4; 28; 29.	130.
8 (MB)	DRS for plastic, lead-acid batteries, scrapped tyres, and glass.	2; 9; 11; 13; 16.	M
9 (MB)	Providing state funds, subsidies, grants or loans for nature conservation and SD projects.	3; 4; 10; 13; 28.	130
10 (MB)	Tax cuts or exemptions for eco-friendly company investment.	1; 3; 13; 16; 32.	M
11 (MB)	Volume-dependent municipal waste charge.	13	M

Table 4. Ten PAC PIs

Item & Type	PIs	Academic Source (see references)	NEC Article
12 (PAC)	Eco-public campaigns through social media, in-person, audio-visual, or traditional media.	4; 9; 15; 16; 17; 33.	194
13 (PAC)	Training qualified professionals and future pedagogical staff in eco-protection and awareness-raising aspects.	14; 24.	194
14 (PAC)	Training & promoting networking among eco-journalists/eco-experts.	14; 17; 24; 25; 27.	M
15 (PAC)	Training climate change adaptation specialists.	M	194
16 (PAC)	Using green nudges to build green public infrastructure.	4; 14; 52.	M
17 (PAC)	Environmental state and public control (e.g., public hearing processes (PHPs))	4; 11; 22.	15 190 85-105
18 (PAC)	Nationwide public cleaning quests.	30.	365
19 (PAC)	Installing separate waste collection facilities/bins.	2; 13.	321
20 (PAC)	Public eco-labelling schemes.	1; 2; 9; 10; 11; 14; 15; 16; 28; 32.	47, 192
21 (PAC)	Launching nationwide reforestation campaigns.	11.	M

Table 5. Seven PR PIs

Item & Type	PIs	Academic Source (see references)	NEC Article
22 (PR)	Strengthening public participation rights in environmental impact assessments, strategic assessments, and eco-audits.	1; 2; 10; 15.	48-79
23 (PR)	Promoting EE-oriented networking among youth organizations, schools, NGOs, and municipalities.	14.	194
24 (PR)	Incorporating corporate green marketing, accounting, and responsibility schemes.	2; 15.	M
25 (PR)	Promoting bottom-up & horizontal networking among eco-businesses and civil society organizations (CSOs) to improve EE policy coordination.	14.	M
26 (PR)	Launching award schemes recognizing outstanding EE role models (e.g., individuals, organizations, companies).	1; 15.	M
27	Strengthening collaboration with educational institutions and	9; 14.	194

(PR)	academia to design tailor-made eco-courses and EE programs.		
28 (PR)	Using voluntary agreements/commitments tools between private actors, NGOs, and state.	1; 2; 10; 13; 31; 34.	129

Table 6. Six EE PIs & One DSP PI

Item & Type	PIs	Academic Source (see references)	NEC Article
29 (EE)	State compulsory EE standards for all educational levels incorporating theoretical and practical-oriented teaching approaches and preparation of model curricula for vocational education and specializations.	16; 17; 24; 25; 56.	193
30 (EE)	Engaging with outdoor landscape by organizing field trips to forest sites, national parks, or botanical gardens.	18; 30; 33.	M
31 (EE)	Engaging students with local communities in voluntary EE programs.	18; 33.	M
32 (EE)	Lecture/seminar presentations in schools and universities by eco-experts.	18; 33.	M
33 (EE)	Presenting eco-problems by painting via inquiry-based education form.	30; 33.	M
34 (EE)	Incorporating emerging research & development-related themes into EE and SD prism.	M	194
35 (DSP)	Free public access to national nature parks (NNPs), botanical gardens, or special nature areas.	9; 11; 34.	M

After thorough in-depth reviews by Kazakhstani eco-experts, a comprehensive and detailed list of 35 eco-awareness-raising PIs was constructed (Tables 3 to 6). These 35 PIs were chosen for their relevance in promoting and facilitating eco-awareness policy measures. Descriptively, the taxonomy is divided into six PI types. Here, each PI type contained their own specific PI examples. In total, five RE items, six MB items, ten PAC items, seven PR items, six EE items, and one DSP item were constructed based on the recommendations from the Kazakhstani eco-experts (see Tables 3 to 6). Out of the 35 PIs, only nineteen items were mentioned in the Kazakhstani NEC, while fourteen items (1, 3, 8, 10, 11, 14, 16, 21, 24, 25, 26, 30, 33 and 35) were not included. Moreover, three items (2, 15 and 34) were constructed based on the NEC article. Overall, this taxonomy is not exhaustive, meaning that it can be updated and extended for future research. Next, the assessment indicator results for all six PI groups are provided.First, concerning five RE PIs (items 1-5), among all nine assessment indicators the highest average scores had LE (1.77) followed by PSI (1.76) and AF (1.65), while the lowest average scores received EF (1.45) and EQ (1.47) indicators. Next, on average, all five PIs were assessed to have middle level scores in all nine assessment indicators with items 2 and 3 being exceptions. Second, regarding six MB PIs (items 6-11), among all nine assessment indicators the highest average scores had LE and PSI (both 1.94) followed by EF (1.79) and AF (1.77), while the lowest average scores received TR (1.54) and PA (1.57) indicators. Next, on average, all six PIs were assessed to have middle-level scores in all nine assessment indicators with items 8, 9, 10 and 11 being exceptions.Third, concerning ten PAC PIs (items 12-21), among all nine assessment indicators the highest average scores received the indicators PSI (2.06) followed by LE (1.99) and AF (1.90), while the lowest average scores received PA (1.60) and AD (1.72) indicators. When comparing all ten PAC PIs to each other, on average, all ten PIs were assessed to have middle level scores in all nine assessment indicators except for PSI.Fourth, concerning seven PR PIs (items 22-28), among all nine assessment indicators the highest average scores received the indicators PSI (2.01) followed by EF (1.86) and LE (1.85), while the lowest average scores received PA (1.56) and EN (1.63) indicators. On average, all seven PIs were assessed to have middle-level scores in all nine assessment indicators except for PSI.Fifth, speaking of six EE PIs (items 29-34), among all nine assessment indicators the highest average scores received the indicators PSI (2.00) followed by AF (1.87), LE (1.87) and EF (1.86), while the lowest average scores received PA (1.56) and EN (1.63) indicators. On average, all seven PIs were assessed to have middle-level scores in all nine assessment indicators except for PSI.

Lastly, regarding the DSP PI (item 35), among all nine assessment indicators the highest average scores received the indicators PSI (2.19) followed by LE (2.15), while the lowest average scores received TR and PA (both 1.70 respectively) indicators.

Research Discussion

For research discussion, we will thoroughly examine specific PIs from six groups except for MB group.

RE PIs

Regarding RE PIs, items 3 and 5 are discussed. In Kazakhstan, eco-journalist's rights to publish and have access to sensitive EI (item 3) have seen improvements since NEC's introduction in 2021 [35]. Nowadays, the public has unrestricted access to EI than before. Since 1990s, numerous training courses were launched for eco-journalists and media representatives. For instance, UNECE [36], OSCE [37] and CAREC [38] organized various eco-training courses on sustainable water management, climate change or green economy. Hence, over the years, eco-journalists gained both theoretical and practical journalistic skills [39]. For instance, in the *Kok-Zhailau* case, the state-led deforestation efforts clashed with eco-activism protests, showing how public eco-rights can challenge unpopular government policy programs [40]. Hence, highlighting the PI's strong PSI and societal support, albeit being weakly enforced and politically under-supported. Referring to past AC reports, the local state authorities are still reluctant to ensure fair and open public participation in public hearing processes (PHPs) [40]. Furthermore, Kazakhstani scholars noted that state restrictions for eco-journalistic activities negatively affected objective eco-reporting and led to insufficient vocational training, weak financial support, unsupportive independent media, and lack of cooperation between NGOs and eco-journalists [26, 27, 41]. Over the last two decades, the government has incorporated AC principles into the NEC, particularly regarding the deregulation of public access to EI (item 5). Our PI's assessment results revealed low enforcement, political acceptability, and effectiveness levels. NGOs, as *Green Salvation Ecological Society* [42] and numerous scholars (e.g., 21, 23, 35) criticized the previous 2007 environmental code for its *limited public access* to EI. In the NEC, the government only has partially addressed the legal shortcomings concerning public access to EI, as the state still has the right to deny public access to EI if the request infringes the holder's personal data [35]. Nevertheless, improvements in environmental concepts as 'EI' are notable due to AC recommendations [22]. Nowadays, apart from legal improvements, the public also has access to various eco-websites, such as air pollution (*air.kz*), normative documents regarding PHPs (*ecoportal.kz*) and AC policy developments (*ecogosfond.kz*). These help to address the eco-journalists' knowledge gap by providing up-to-date information about new legislative changes, and benefits state authorities with international and local eco-organizations (e.g., UNDP, UNECE, ECOJER) providing more precise environmental policy recommendations. However, eco-activism problems with recent uncontrolled excess urban construction of Almaty's residential buildings have put huge pressures on communal infrastructures, trivializing green infrastructure developments, and raising the importance for eco-journalistic presence to educate citizens about such environmental issues [43].

PAC PIs

Since the years of independence, a rise in environmental PACs can be noted in Kazakhstan (item 12), particularly with nationwide public cleaning quests (item 18) and reforestation efforts (item 21). Generally, public eco-awareness campaign's goal is to inform and educate people about environmental issues, where policy examples include the involvement of environmental NGOs (e.g., UNDP, UNEP) and eco-companies (e.g., CAREC, Recycle Birge). For instance, in recent years the UNDP has financed numerous eco-awareness campaigns by promoting plastic recycling [44]; EE-related pilot schools [45]; tree-planting efforts [46]; eco-tourism programs [47]; or educating local farmers about adverse climate change impacts [48]. Over the last five to ten years, various nationwide eco-clean-up and tree-planting events (e.g., *Together Clean Kazakhstan*) alongside eco-movements as *Akbota Public Fund* or *Orleu-Consulting* were launched [49]. However, early 2000s reforestation efforts were largely ineffective despite 2003 Forest Code legislative amendments and rehabilitation funding programs of *Zhasyl El* and *Zhasyl Damu* [50]. Only since 2021, the UNDP and MENR launched numerous reforestation projects supporting sustainable agriculture development to improve forest management [46]. Consequently, supporting the preservation of 11.2% of forested areas from climate change-related impacts [51]. In conclusion, both items 18 and 21 help not only to build more

effective networking among government institutions, eco-businesses, and local communities, but also possess high effective and PSI levels.Next, regarding items 13 and 14, nowadays numerous international and regional organizations provide eco-training courses for improving eco-journalist's reporting skills and environmental knowledge, such as UNECE [36], OSCE [37] or CAREC [38]. Likewise, eco-companies as *Recycle Birge*, *Kazakhstan Waste Recycling,* or *ECOSEN* also teach about the importance of waste recycling and ways to promote eco-infrastructure [49]. For example, while *Recycle Birge* provides online services on installation of separate waste collection facilities, *ECOSEN* provides EE courses about green office and green nudging initiatives. Based on assessment results, both items showed high legitimacy and PSI levels with low PA and middle-level EF scores. Thus, these two PIs receive more societal than political support.

Next, usage of green nudges (item 16) is crucial for developing not only sustainable green infrastructure, but also in building pro-environmental behavioural changes that support resource conservation or recycling. Here, examples include implementing urban bike-sharing services or making recycling bins eye-catching. Considering that green nudges and their infrastructural facilities are under-studied and under-developed due to weak regulatory frameworks and insufficient green nudging eco-experts, it is advised for policy makers to assess how effectively existing green nudges are implemented based on UNEP metrics [52]. Based on assessment findings, this item has low PA and EN levels despite showing high scores in LE, EF, and PSI.

PR PIs

Simply, PR PIs are used to facilitate government's policy-making processes. They are effective as PAC PIs and possess high PSI scores, albeit show weak socio-political support and enforcement. For our discussion, items 22 and 25 are examined.First, regarding item 25, nowadays many local state-led and NGO-led Kazakhstani eco-organizations (e.g., *Greenwomen Kazakhstan*, *Ecoforum*, *EcoMuseum*) facilitate eco-networking processes. While *Greenwomen Kazakhstan* and *EcoMuseum* promote public eco-participation, renewable energy, and eco-education, *Ecoforum* strives to unite local eco-organizations in supporting eco-awareness campaigns about nuclear waste management, anti-logging activities, or water resource management. One of the currently operating eco-based systems allowing both to cooperate is *EcoQoldau* platform. This online platform allows eco-companies to launch eco-start-ups involving waste utilization or recycling. However, presence of red tape and strong state influence still hinder its full implementation [53]. Thus, weak regulatory enforcement and low political acceptability are still prevalent despite its middle level effectiveness and high PSI score. In recent years, Kazakhstani eco-experts believe that CSOs will further strengthen eco-awareness networking mechanisms and serve as main eco-agenda trendsetters, who can aid in public oversight functions as identifying eco-regulatory violations [53]. Another procedural PI, which was stipulated in NEC Articles 48-47, is implementation of environmental impact assessments and PHPs (item 22). According to Kumar [53], numerous eco-experts have criticized the PI's developments as *mostly fictitious* despite recent NEC's regulatory improvements. Similarly, Mogiluk [54] criticized past Kazakhstani AC-related policy implementation. Previously, state authorities ignored the PHP violations by allowing only '*accredited*' stakeholders to participate and provide biased environmental reports, thus, leading to weak eco-regulation compliances [54]. For instance, alike the *Kok-Zhailau* case, the *Ustyurt Plateau* case in 2016 showed how big oil extraction company's interests conflicted with eco-activist's interests [54]. Other controversial PHP cases were also concerning oil spills in West Kazakhstan [54]. Despite weak enforcement mechanisms, PHPs showed a high legitimacy score.

EE PIs. According to the NEC, the importance of state-led EE policies was highlighted in Article 193 [35]. Since early 1990s, numerous state-led EE programs were launched and incorporated into the educational system. With the signing of AC and Rio de Janeiro conventions in 1990s, the government introduced its first national EE strategy in 1998 [49]. Afterwards, EE elements were included in school curriculums [24], and in 2005 in universities [25].

In the past five years, the government and UNDP actively funded EE programs, such as via 2021 pilot project that adopted new EE curriculums in 100 Kazakhstani schools and provided eco-training for 130 eco-teachers using effective eco-teaching guidelines [45]. Similar programs also included various tree-planting events organized by youth organizations (e.g., *Zhas Ulan*, *Zhasyl El*) [55]. Nevertheless, the lack of professional ecologists and ecology-related jobs were noticeable throughout the 1990s and early 2000s [24, 25]. Over the years, EE policies faced weak enforcement, policy ineffectiveness, and lacked a comprehensive policy vision [24, 56], while also using ineffective

theoretical school-based teaching guidelines lacking focus on green skills [24]. The PI's assessment results showed weak enforced levels, meaning that the PI's full potential as effective policy tools are still suppressed and undervalued. If comparing EE with PAC and PR PIs, they have identical political support, positive social impact, and effectiveness scores, but share the similar weak enforcement issues.

DSP PI

Opening NNPs plays a vital role in preserving nature and developing society's eco-culture. In Kazakhstan, only 14 NNPs are recognized [47]. Next, this PI is assessed as highly democratic, effective, and administratively feasible, albeit showing weak enforcement. Hence, developing strong societal pro-ecological worldview and facilitating effective implementation of other PIs, especially via items 16, 23, and 25.By building eco-tourism infrastructure facilities (e.g., tourist accommodations or rental of tourist equipment), visitors experience improved eco-awareness and recreational life, pointing to its high PSI. Furthermore, in recent years, the government is supporting local communities and private eco-companies via state grants aimed at promoting eco-tourism entrepreneurship businesses climate and green nudging initiatives, especially in Katon-Karagay NNP with constructing tourist accommodation and cycling areas [47]. Thus, showing strong political support, too.These eco-tourism initiatives legitimize state's environmental policy initiatives by building stronger public trust. However, issues with transport inaccessibility, low-quality road infrastructure, low quality of eco-tourism services, insufficient funds, and lack of professional tour guides devalue the PI's effectiveness [57].

Conclusion

A newly constructed eco-awareness PI typology consisting of 35 PIs was presented, which was divided into six types, namely RE, MB, PAC, PR, EE, and DSP, where 19 were used in Kazakhstan's NEC. Based on nine eco-assessment indicator analysis, PAC and DSP PIs possessed the highest scores.

First, regarding the PA indicator, DSP PIs had the highest scores followed by PAC PIs, where top PI included items 18, 19, and 35 and lowest items being 5 and 3. Similarly, PAC, MB and DSP PI types were also socially well-supported. When speaking of EN indicator, here the EE PIs were considered as the most weakly enforced in Kazakhstan unlike DSP and PAC PIs. Nevertheless, all PI types except for RE showed high PSI levels. However, the most effective PI included items 18 and 19. Next, various PI items and their policy developments were discussed. First, concerning RE PIs, PIs covering the deregulation of public access to EI and strengthening eco-journalist's eco-rights have seen significant legislative progress after the adoption of NEC. Nevertheless, they still face policy enforcement and government censorship challenges, which inhibit them to fully support the AC and EE regulatory measures. For all nine assessment indicators, RE PIs had the lowest average scores. Next, regarding MB PIs, usage of green financing and DRS mechanisms have only recently gained social support. Nowadays, the share of allocated green investments in EE is still low with enforcement and limited reporting issues negatively affecting PI's policy viability. Likewise, the Kazakhstan's DRS developments are still under-developed, weakly enforced, and receive inadequate political support. Despite low social awareness for waste management, local eco-companies as *West Dala* provide EE to citizens, while *EcoQoldau* system offers funding opportunities for eco-companies.

Next, PAC PIs were examined. Here, the implementation of nationwide public cleaning quests with provision of eco-training for eco-experts and eco-journalists gained since 1990s some positive momentum owing to strong governmental and local NGO support (e.g., *ECOSEN* and *Recycle Birge*). However, green nudging approaches are still under-developed, under-researched, and lack both institutional and green infrastructural development. Unlike PAC PIs, procedural PIs have weaker socio-political support and legal compliance. In Kazakhstan, the positive impact of environmental NGOs in facilitating eco-networking processes via *EcoQoldau* platform were noted, especially highlighting *Ecoforum* or *Greenwomen Kazakhstan*. However, public oversight functions of environmental processes and introduction of AC policies are weakly enforced with PHP-related violations being still prevalent, as in *Kok-Zhailau* and *Ustyurt* cases. Next, speaking of EE PIs, since 1990s, Kazakhstan saw numerous significant progresses made in EE policy developments, as the government and NGOs gradually incorporated EE into the educational system and AC principles into eco-regulatory system. Albeit systemic policy ineffectiveness, weak EE standards, and low compliance measures prevailed, EE PIs were assessed as effective and demonstrating high PSI level

with slightly less social support than PAC PIs and political support than PAC, MB, and PR PIs.Lastly, DSP PI proved to be the most effective, administratively feasible, politically acceptable tool with the highest PSI score. Moreover, as this PI makes use of green nudges and promotes nature-based tourism, it has proven especially effective in developing eco-tourism entrepreneurship. But issues with policy enforcement, transport accessibility, low quality of eco-tourism services, and lack of funding underscore its policy viability.

Research Limitations & Future Research Suggestions. Regarding the first research limitation, several eco-experts were not fully familiar with all 35 PIs, especially concerning regulative and market-based tools. Consequently, skewing PI's assessments results and data reliability. Second, it is also debatable whether some PIs really belong to assigned PI type groups. For instance, items 18 and 23 could belong to RE type, while item 35 might represent PR type.Third, specific assessment indicators were omitted, such as cost-related indicators. Hence, further refinement of assessment indicators is required to better adapt it to Kazakhstan's policy context.

Lastly, as a future research suggestion, studying the reasons for why specific PIs are more effective, politically acceptable, or better enforced than others via in-depth interviews could be interesting.

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ЭКОЛОГИЯЛЫҚ АҚПАРАТТАНДЫРУ САЯСАТЫНЫҢ ҚҰРАЛДАРЫ: ТАКСОНОМИЯНЫ ӘЗІРЛЕУ ЖӘНЕ БАҒАЛАУ

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