

# Green Banking Tools for the Implementation of a State's Environmental Policy: Comparative Study.

Markhayeva, Bayanslu, Beisenova, Madina, Ibrayev, Alisher Serikbolovich, Serikbayeva, Gaukhar y Arrieta-López, Milton.

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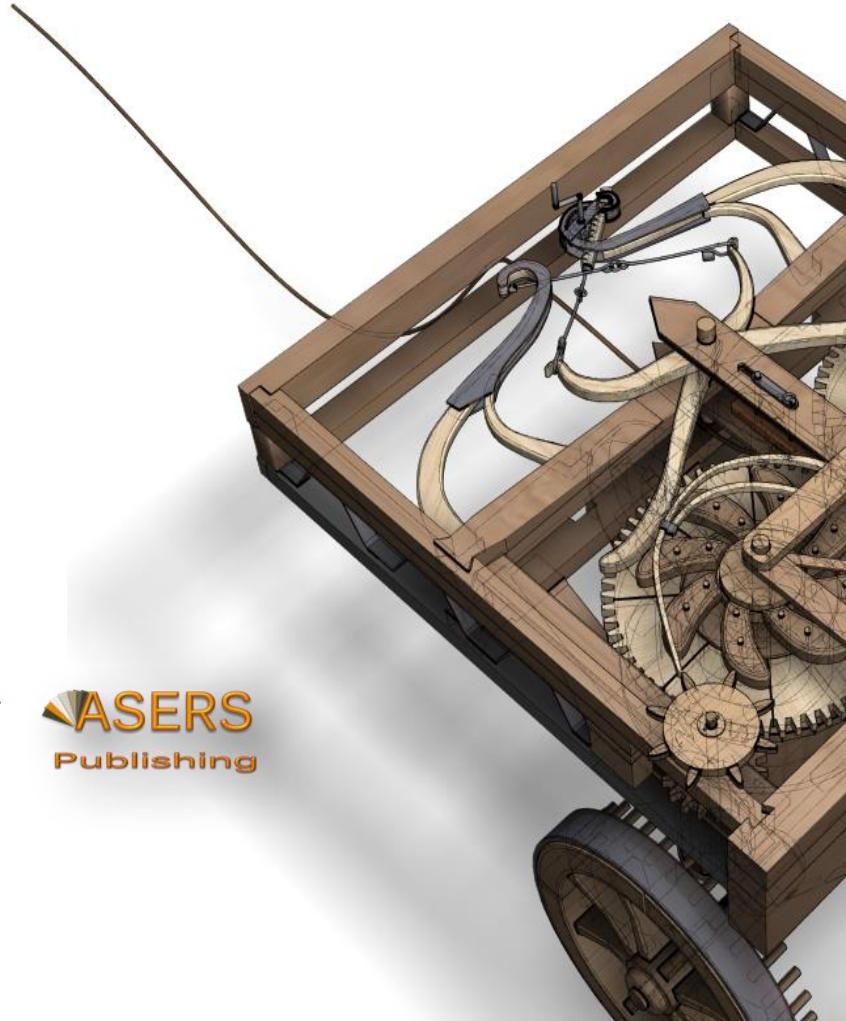
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## Green Banking Tools for the Implementation of a State's Environmental Policy: Comparative Study

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### Abstract:

The active implementation of climate change projects, the latest resource- and nature-saving technologies, and environmental measures for the green growth of national economies require financial support. Currently, financial resources for environment-related investments and innovations are raised due to the increase of operational activities in banking institutions aimed at introducing green projects on the principles of environmental and socially responsible financing. This modern trend, known in the financial sphere as green banking, becomes relevant in countries where it is quite uncommon (for example, the Russian Federation and the Republic of Kazakhstan). The study aims at identifying the preferred tools for implementing the mechanism of green banking in Russia and Kazakhstan. The comparative analysis of expert opinions from Russia and Kazakhstan allows identifying both similarities and differences regarding the preferred instruments for providing monetary credits by green banking. However, the best lending rates for legal entities are considered the most preferable for experts from both countries.

The authors of the article conclude that the creation of a segment of green products and services in the financial market will serve not only the implementation of the green economy principles but also the formation of an effective environmental policy as a mechanism for implementing sustainable development goals supported by environmental financial policy.

**Keywords:** green finances; green investments; green bonds; green insurance; benefits.

**JEL Classification:** E50; O13; Q58.

## Introduction

New technologies (Yerkinbayeva *et al.* 2022, 115), principles, and approaches to production (Dokholyan *et al.* 2022, 597) and the effective implementation of the green economy concept (Balova *et al.* 2021, 1269) aimed at achieving sustainable development goals can be ensured through the acquisition of financial resources in order to transit to an environmentally responsible economy which simultaneously supports social development. The green economy is promoted through the large-scale implementation of climate change projects (Laikhanov *et al.* 2021, 169), the latest resource- and nature-saving technologies, and environmental measures (Martirosyan *et al.* 2022, 151) due to their active financial support (Suleimenova *et al.* 2021, 376). These mechanisms and regulators are known as green finance (Scholtens 2017, 500).

Green finance is a sector of the financial market that covers institutions, mechanisms, and tools to attract investments in energy-saving technologies (Bezpalov *et al.* 2021, 218), renewable energy sources (Lawrencenko *et al.* 2017, 177), environmental innovations (Tsenina *et al.* 2022, 63), and measures to improve energy efficiency and build a green transport infrastructure (Piselli *et al.* 2022, 1381), *i.e.* to encourage investments in a green recovery package (Wang and Zhi 2016, 311). The growing need conditions the significance and prospects for developing this sector of the financial market for the implementation of green initiatives in various countries (Chowdhury *et al.* 2013, 104). Thus, the need for annual global investments in sustainable development until 2030 (green mortgage loans (Kalymbek *et al.* 2021, 1299), corporate lending of green technologies (Nurgaliyeva *et al.* 2019, 1019), sustainable transport (Soum *et al.* 2022, 715), energy storage technology (Zhao *et al.* 2020, 451), sustainable agriculture (Nugmanov *et al.* 2022, 268), clean energy (Dudin *et al.* 2022, 110)) is estimated by the International Finance Corporation at \$23 trillion (Park and Kim 2020, 5). The need for green investments in the energy sector is estimated from \$400 billion to \$1-1.25 trillion. From \$40 billion to \$100 billion ensures general access to electricity on an annual basis (Battiston *et al.* 2017, 283).

It is worth mentioning that the "Principles of the state policy in the area of environmental development of the Russian Federation for the period up to 2030" (Osnovy gosudarstvennoi politiki 2012) states that the state policy in the field of environmental development is supported not only from budgetary funds but also from extrabudgetary sources.

A similar provision is contained in Article 130 of the Environmental Code of the Republic of Kazakhstan (Kodeks Respubliki Kazakhstan 2021). Accordingly, green investments are attracted for the introduction and implementation of green technologies, including at the expense of "sources of other organizations". At the same time, the Environmental Code of the Republic of Kazakhstan provides two concepts of green financing and green loans, which are "targeted loans aimed at financing green projects".

These provisions correspond with the provisions regarding the range of instruments for investing in the green economy activities (green investments, investments in environmental and green innovations) presented in the following scientific studies (Liu *et al.* 2015, 46; Yin *et al.* 2019, 247). Based on (Bahl 2012, 176) and the classification of tools for encouraging environmental investments and innovations, in particular, in terms of attracting financial resources, green banking with its specific instruments and banking products draws special scientific and practical attention. It is present in both the Russian and Kazakh banking systems but still underdeveloped at the theoretical and practical levels.

This situation is due to two reasons. The first is that green ideas for bank management are still not a priority. The second reason is that the green worldview is not dominant in the public consciousness and the consciousness of Russian or Kazakh laymen.

### *Literature overview*

According to (Debnath and Roy 2019, 75), green banking is a socially responsible banking model aimed at reducing the anthropogenic burden on the ecosystem and creating future benefits. However, this definition does not reveal the specifics of green banking and makes it rather ambiguous. The work (Zhang *et al.* 2011, 1321) provides a generalized understanding of green banking as a modern financial trend that promotes the use of resource-saving technologies and eco-friendly products to reduce the environmental damage caused by the operational activities of financial institutions to implement environmental projects based on the principles of environmental and socially responsible financing.

In conformity with (Biswas 2011, 32), the banking sector can play an intermediary role between economic development and environmental protection, promoting environmentally sustainable and socially responsible investments. Scholars (Chen *et al.* 2022, 1292) note that a multi-level network of financial intermediaries is being formed in the green banking sector. It consists, on the one hand, of global, regional, and national green banks

created from scratch (in functional terms) and development banks and, on the other hand, of separate eco-financial divisions opened within the existing commercial banks.

Within this network, green banks are the most developed institutions. Experts (Dialysa 2015, 128) define a green investment bank as an organization created specifically to promote private investments in climate-resilient, low-carbon infrastructure, and other green sectors.

Although green banks have different names, sizes, and approaches, they were created in order to overcome investment barriers and take advantage of available public resources for green investment objects (Deka 2018, 9). Thus, green banks were formed at the national level in Australia, Japan, Malaysia, Switzerland, and Great Britain; at the level of states in California, Connecticut, Hawaii, New Jersey, New York, and Rhode Island (USA); at the county level in Montgomery (Maryland, USA); at the city level in Masdar (UAE) (Sarma and Roy 2020, 1).

Thus, green banks are specialized institutions that are part of the local financial infrastructure. These primarily focus on supporting environmental projects in local markets through the use of public and private capital (Lalon 2015, 34).

The article aims at identifying the preferred tools for the implementation of green banking in Kazakhstan and Russia.

The research tasks are as follows:

- To identify the main tools for the global implementation of green banking;
- To determine the preferred instruments for providing monetary credits by green banking in Kazakhstan and Russia.

The research hypothesis is that the creation of a segment of green products and services in the financial market will serve not only the implementation of the green economy principles but also the power and effectiveness of environmental policy as a mechanism for implementing sustainable development goals supported by environmental financial policy.

## 1. Methods

To solve the tasks set in the article, we used general scientific methods: a) theoretical: the analysis of scientific sources on the research topic; b) empirical: an expert survey.

The study was conducted in three stages from May to July 2022.

At the first stage of the study, we studied scientific and analytical works on the research topic.

The analysis of publications on the research topic allows considering scientific approaches to the concept, essence, and structure of green banking, as well as determining the main tools for implementing green banking.

At the second stage, we had online communication with the experts. The expert survey was conducted in Russian via e-mail.

We sent e-mails to 54 experts, including 25 respondents from Russia and 29 respondents from Kazakhstan. The experts were employees of the banking sector, auditors of companies, representatives of the Kazakhstan Stock Exchange (KASE) and the Moscow Exchange, and university professors who majored in Finance and Credit. The questionnaire stated that if the experts did not have the necessary knowledge and experience in working with green lending tools, they should not participate in the survey. We prepared two versions of the questionnaire. For the experts from Kazakhstan, questions related to the national and local context, as well as the work of the government to develop green banks. For the experts from Russia, we included only those questions that were relevant to the Russian experience in the development of green banking. The wording was almost the same in order to compare the answers of the experts from both countries. They were asked to substantiate their answers in a free form. Fifty-one respondents sent their responses.

The main question asked to the experts in connection with the objective and tasks of the study was as follows: What are the preferred tools for providing monetary credits by green banking to legal and natural entities?

All the respondents were informed about the objective of the survey and our intention to publish its results in a generalized form.

After receiving the answers, the experts were asked, depending on the significance of green banking instruments, to arrange them on a scale of order and assign points. This helped to determine the ranking of each instrument.

For a more objective analysis of the data obtained during the expert survey, the compliance of expert opinions was mathematically measured using Kendall's coefficient of concordance (W).

$$W = 12S/n^2(m^3-m),$$

1.1



Where  $S$  is the sum of the squared deviations of all the ranks given to each green banking instrument from the average value;  $n$  is the number of experts;  $m$  is the number of assessed green banking instruments.

Further, the information obtained during the expert survey was processed to determine the impacts of the green banking instruments, form a rank transformation matrix, and calculate the arithmetic mean of impacts for each green banking instrument. The final impacts identify the significance of green banking tools from the viewpoint of experts.

## 2. Results

The analysis of scientific publications allows determining a set of basic tools for the implementation of green banking in non-CIS countries (Table 1).

Table 1. The main instruments for implementing green banking in the world

No.	Green banking instruments	Source	Ranking		
			Experts from Russia	Experts from Kazakhstan	Total
1	Green investments	N. Biswas (2011), G. Deka (2018), F. Dialysa (2015), J.Y. Liu <i>et al.</i> (2015), H. Park and D.J. Kim (2020), M. Wörsdörfer (2016), W. Yin <i>et al.</i> (2019)	4	4	3-5
2	Green bonds	F. Dialysa (2015), J.Y. Liu <i>et al.</i> (2015), R. Meena (2013), K.A. Thombre (2011), M. Wörsdörfer (2016), B. Zhang <i>et al.</i> (2011)	2	3	2
3	Green insurance	S. Debnath and S. Roy (2019), G. Deka (2018), R.M. Lalon (2015), W. Yin <i>et al.</i> (2019), B. Zhang <i>et al.</i> (2011)	6	2	3-5
4	Preferential lending rates	S. Bahl (2012), P. Sarma and A.A. Roy (2020), M. Wörsdörfer (2016), W. Yin <i>et al.</i> (2019)	1	1	1
5	Partial loan guarantee for green projects	S. Bahl (2012), P. Sarma and A.A. Roy (2020), M. Wörsdörfer (2016), W. Yin <i>et al.</i> (2019)	3	5	3-5
6	Increasing credit limits	P. Sarma and A.A. Roy (2020), M. Wörsdörfer (2016), W. Yin <i>et al.</i> (2019)	5	6	6
7	Green mortgage	S. Bahl (2012), N. Biswas (2011), Dokholyan <i>et al.</i> (2022), J.Y. Liu <i>et al.</i> (2015), R. Meena (2013), S.	7	7	7
8	Green loans	S. Bahl (2012), N. Biswas (2011), Dokholyan <i>et al.</i> (2022), R. Meena (2013)	8	8	8
9	Biobanking	S.A.A. Bukhari <i>et al.</i> (2022), S. Debnath and S. Roy (2019)	9	9	9

Note: based on the analysis of scientific literature

Although the green market sector is just being formed in Russia and Kazakhstan, we considered it important to reasonably select tools for implementing green banking. Of the listed tools, the most effective and adequate to economic realities are the world green segment of the banking sector (Table 1).

In particular, this refers to new tools for providing monetary credits by green banking. According to the expert survey, the most preferable instruments are presented in Tables 2 and 3.

According to Kendall's coefficient of concordance ( $W$ ) ( $W_{\text{Russia}} = 0.66$ ;  $W_{\text{Kazakhstan}} = 0.74$ ), the experts have similar opinions since the value  $W > 0.5$  indicates the objectivity of the survey results. This circumstance determines the impacts of the instruments for providing monetary credits by green banking in Russia and Kazakhstan.

According to the calculations, the most preferred instruments for providing monetary credits by green banking in Russia are preferential credit rates (0.32) for legal entities and an extended loan term (0.23), for financing environmental projects and issuing green securities (0.17).

Table 2. The preferred tools for providing monetary credits by the Russian green banking

No.	Green banking instruments	%*	Ranking	Impact
For legal entities				
1	Preferential credit rates (below market rates) for financing environmental projects, green technologies, environmental goods and services, purchasing environmental equipment on leasing terms and attracting green private investments	80.4%	1	0.32
2	Extended loan term to finance large-scale environmental infrastructure projects, etc.	76.5%	2	0.23
3	The issue of asset-backed securities to finance large-scale infrastructure projects aimed at protecting the environment (green securities)	72.5%	3	0.17
4	The sale of municipal bonds by financial institutions to promote environmental projects (partial loan guarantee for green projects)	68.6%	4	0.12
5	The provision of loans, credits or other services for the purchase of emission certificates (emission certificate trade)	58.8%	5	0.07
For natural entities				
6	Preferential credit rates for the construction and purchase (green mortgage) of private green housing, energy-efficient and resource-saving technological equipment for premises and green road transport, which decreases environmental pollution (green car loans)	56.9%	6	0.05
7	Extended loan term for the construction of private green housing, for the purchase of energy-efficient and resource-saving technological equipment for premises and green road transport	52.9%	7	0.03

Note: based on the expert survey; %\* of expert references

Table 3. The preferred tools for providing monetary credits by the Kazakh green banking

No.	Green banking instruments	%*	Ranking	Impact
For legal entities				
1	Preferential credit rates (below market rates) for financing environmental projects, green technologies, environmental goods and services, purchasing environmental equipment on leasing terms and attracting green private investments	77.6%	1	0.36
2	Green insurance for protecting legal entities from possible environmental risks	72.5%	2	0.27
3	The issue of asset-backed securities to finance large-scale environmental infrastructure projects (green bonds)	68.4%	3	0.18
4	Reducing requirements for the minimum rating in order to include green bonds in the Lombard list of the KASE securities	62.4%	4	0.11
5	The inclusion of green bonds in the KASE repurchase agreement at low discounts	54.2%	5	0.08

Note: based on the expert survey; %\* of expert references

The survey of experts from Kazakhstan partially coincides with the answers of their Russian counterparts. Thus, the most preferred instruments for providing monetary credits by green banking in Kazakhstan are also preferential credit rates intended for legal entities (0.32) and the issuance of green securities (0.17), followed by green banking insurance as protection of legal entities from possible environmental risks (0.23). In addition, the experts from Kazakhstan, unlike their Russian colleagues, indicated the green banking tools concerning the regulator's actions when placing green bonds. The use of green banking tools by individuals was not mentioned.

### 3. Discussion

The comparative analysis of expert assessments of the main tools for implementing green banking (Table 1) shows that both Russian and Kazakh experts selected preferential credit rates and the issue of green bonds. At the same time, the Kazakh experts emphasized green insurance and the Russian experts highlighted partial loan guarantees for the implementation of green projects.

The set of green banking instruments presented in Table 1 defines their main groups formed by the relevant tools. The exception is biobanking as an innovative tool for stimulating investments in the restoration of ecosystems and ecosystem services, which is only at the stage of formation and development in the banking system (Debnath and Roy 2019, 75).

The group of green loans includes, for example, such instruments as "an extended loan term for financing large-scale infrastructure projects to protect the environment" (Bahl 2012, 176), "a loan for the purchase of certificates for the emission of pollutants" (Biswas 2011, 32), etc. The group of green bonds comprises Climate Bonds (Wörsdörfer 2016, 473), Blue Bonds (Meena 2013, 1181), Forest Bonds, Conservation Impact Bonds (Meena 2013, 1181; Zhang *et al.* 2011, 1321), etc.

Thus, a wide range of tools for the implementation of green banking turns out to be a driver for promoting the green economy around the world.

The international experience of green banking demonstrates many of its tools. The Russian experts pay special attention to those instruments whose implementation is desirable and realistic, even though the share of assets of banking institutions in the gross assets of the Russian financial sector is more than 90% (Kodeks Respubliki Kazakhstan 2021). Therefore, domestic banking institutions can become the main financial donors of resource-saving and eco-friendly activities, as well as the ecological modernization of the entire economic complex. It is worth mentioning that the green banking concept is being implemented in the Russian banking sector. This was facilitated to a certain extent by the signing of the Paris Agreement in 2016 in accordance with the United Nations Framework Convention on Climate Change (UNFCCC) to regulate measures to reduce carbon dioxide emissions starting from 2020.

The green banking tools proposed by the experts (Table 2) should be gradually introduced to the market of banking products and services in Russia and Kazakhstan. However, this process needs to be facilitated since there are a few legally prescribed concessional lending and project financing instruments related to energy-efficient measures.

To stimulate environmental initiatives on the part of financial institutions and their clients, it is necessary to form a reliable legislative field, which is consistent with the study of Chinese specialists (Liu *et al.* 2015, 46). Consequently, it is crucial to focus on the state's need to create such conditions under which it would be beneficial for financial institutions to introduce green products and services, for example, by reducing the discount rate of the Central Bank for banks that provide loans for environmental projects.

The works (Deka 2018, 9; Lalon 2015, 34) focus on the fact that there are many forms and instruments of state support for commercial banks (for example, preferential credit programs and credit lines for senior and subordinated debt) that could support green banking. In our opinion, it is necessary to develop the emission mechanism of green bonds and other financial instruments that will stimulate the systemic greening of the most "dirty" sectors of the economy, as shown in (Chowdhury *et al.* 2013, 104).

Therefore, the state should create favorable conditions, firstly, to expand the range of instruments for concessional lending and financial support for environmental activities and, secondly, to introduce green products and services into the functioning of financial institutions.

## Conclusion

As a result of the study, we determined the main tools for the implementation of green banking in the world and the preferred instruments of the mechanism for providing monetary credits by green banking in Russia and Kazakhstan.

The comparative analysis of expert opinions from Russia and Kazakhstan allows identifying both similarities and differences regarding the preferred instruments for providing monetary credits by green banking. However, the best lending rates for legal entities are considered the most preferable for experts from both countries.

The study results confirmed the hypothesis that the creation of a segment of green products and services in the financial market will serve not only the implementation of the green economy principles but also increase the power and effectiveness of environmental policy as a mechanism for realizing sustainable development goals supported by environmental financial policy.

The study has limited expert sampling and focuses on the provision of only monetary credits by green banking in Russia and Kazakhstan. Further research should develop more specific recommendations on the use of the entire list of tools for implementing green banking and changing the legal framework in order to expand the range of financial products in green banking.

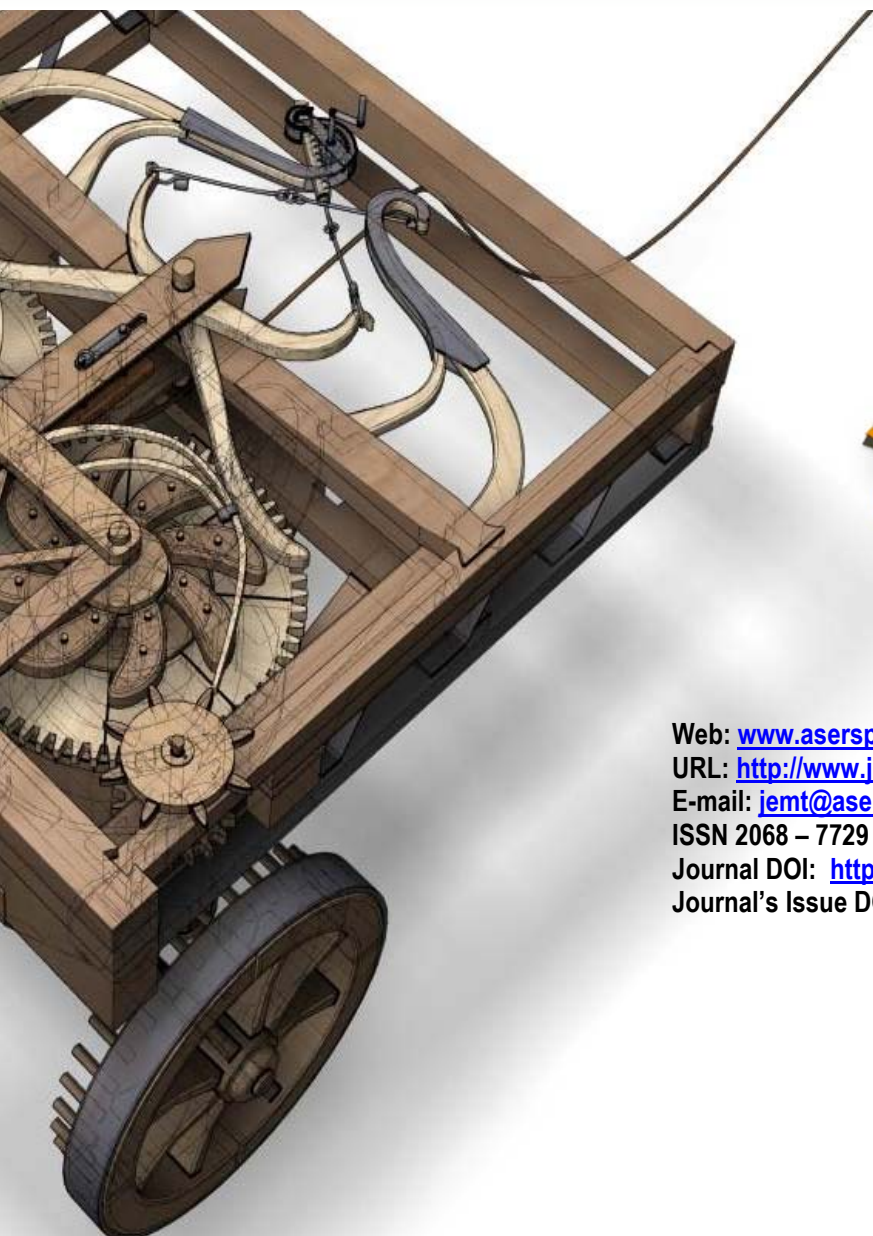
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