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The Development of Agro-Tourism Based on Arabica Coffee Plantation in Bali

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Abstract:

The agricultural sector plays an important role in the economic style of Kabupaten Bangli, where the population depends on their livelihood as farmers mostly. The tourist attraction of the tourism sector in agriculture is the magnetism of Arabica Coffee agro-tourism. The area of Arabica coffee plantations in Kabupaten Bangli in Bali which covers more than 1883.92 hectares as a whole. One of the districts (kecamatan) in Kabupaten Bangli that has the largest area of Arabica coffee plantations is Kecamatan Kintamani, which is around 1,836 hectares with 2017 production amounting to 2,112 tons per hectare per year. This is the area of coffee plantations which is the largest and with the highest amount of production among other districts in Kabupaten Bangli. This has the potential to support agro-tourism based on Arabica coffee plantations. The method used in this study is qualitative using mathematical operations. In this study, data analysis using AHP (Analytical Hierarchy Process) data analysis techniques with the help of expert choice 11 software. The purpose of this study is to examine agro-tourism development strategies which are based on actors, factors, objectives, and alternative strategies for developing Arabica Coffee agro-tourism in Kabupaten Bangli, Bali.

Keywords: agro-tourism; arabica coffe; plantation; development; Bangli; Bali.

JEL Classification: R11; Q53; Q13; Q15; Q16; Q19.

Introduction

A special coffee agro-tourism in Kabupaten Bangli is smallholder plantations of Arabica Coffee which covers more than 1883.92 hectares as a whole. One of the districts (kecamatan) in Kabupaten Bangli that has the largest area of Arabica coffee plantations is Kecamatan Kintamani, which is around 1,836 hectares with 2017

production amounting to 2,112 tons per hectare per year. This is the area of coffee plantations which is the largest and with the highest amount of production among other districts in Kabupaten Bangli. This has the potential to support agro-tourism based on Arabica coffee plantations (Dinas Pariwisata dan Kebudayaan Kabupaten Bangli, 2018).

Kintamani Arabica Coffee is the first product in Bali to get legal protection by the Directorate General of IPR of the Ministry of Law and Human Rights of the Republic of Indonesia on December 11, 2008 with certificate No. ID IG 000000001. The basis for its consideration of granting this Geographical Indication Protection is because Kintamani Coffee comes from a specific region altitude of 900-1000 meters above sea level which is suitable for the growth of Arabica coffee. It has a homogeneous farming system in the Kintamani area in Kabupaten Bangli (Dinas Pertanian dan Tanaman Pangan Kabupaten Bangli, 2018).

The purpose of this study is to examine agro-tourism development strategies, based on actors, factors, objectives, and alternative strategies for developing Arabica Coffee agro-tourism in Kabupaten Bangli, Bali.

1. Literature Review

Several studies have been carried out in the development of agro-tourism such as research (Kristiana and Thendora 2016) on the Strategy for the Efforts of Developing Sustainable Tourism for Community-Based Agro Tourism in *Kampung Domba Terpadu Juhut*, they used explorative descriptive methods. The development of agro-tourism is carried out by conducting an advocacy approach in developing agreements with outsiders, developing infrastructure and carrying out an agreement of revenue sharing between travel agents and agro-tourism managers. Sumantra *et al.* (2015), the Development of Community Coffee Based Agro-tourism in Kecamatan Tukur, Kabupaten Pasuruan, using the Participatory Rural Appraisal (PRA) approach model, the Entrepreneurship Capacity Building (ECB) model and the Technology Transfer (TT) model. The Agro Tourism Development Strategy in Kecamatan Tukur which is the key factor is the involvement of various elements that are able to create synergism between components, therefore empowerment runs intensively and productively which has implications for sustainability. On the Development of the Community-Based Salak Agro Tourism Model in Desa Sibetan, using the Participatory Rural Appraisal (PRA) model, Rapid Rural Appraisal (RRA) and SWOT analysis. The development of salak agro-tourism in Desa Sibetan is carried out in biophysical structuring, social, cultural, institutional aspects, funding from the government and other sources as well as marketing and enhancing cooperation networks as well. Research by Gurindawangsa *et al.* (2017), the Analysis of Agro Tourism Product Development Strategies in Malang, East Java used descriptive approach for their methodology. The strategy for developing agro-tourism products starts from developing human resources and developing partnerships / partnerships with related parties. Palit *et al.* (2017) conducted research about the Rurukan Agro-tourism Development Strategy using a SWOT analysis. The strategy of developing agro-tourism in Rurukan is to utilize existing tourism objects, cultural development areas, and soil fertility in producing fruits to attract investors and tourists.

2. Methodology

2.1. Time and Location of the Research

The study was conducted in June to July 2019 in Kintamani Kabupaten Bangli which covers area in two villages namely Desa Catur and Desa Batur Tengah. The Kintamani region is a tropical geographical type which is located at latitude between 115°5'E and 114°30'E, longitude between 8°10'S and 8°20'S. This region has a cool mountainous nature, including slopes and undulating plains. Its vegetation includes forest plants, horticulture and food crops and Arabica coffee. Kintamani area is very appropriate for Arabica coffee cultivation because it has a height of 900 and 1,550 m above sea level. For coffee plantations in Kintamani at an altitude between 1,100 and 1,400 meters. Temperatures in the Kintamani region range between 15°C and 25°C throughout the year and relative humidity exceeds 80%. The high temperature difference between day and night which is an important factor for Arabica coffee takes place consistently. The Kintamani area also has entisol and inceptisol volcanic soils very proper for Arabica Coffee plants (Society for the Protection of Geographical Indications, 2011).

2.2. Research Methods

The method used in this study is qualitative using mathematical operations. In this study, data analysis using AHP (Analytical Hierarchy Process) data analysis techniques with the help of expert choice 11 software. In this study a field survey was conducted, determining experts, interviews and questionnaire assistance. The determination of experts is carried out with the following criteria: being willing to be a respondent, having the

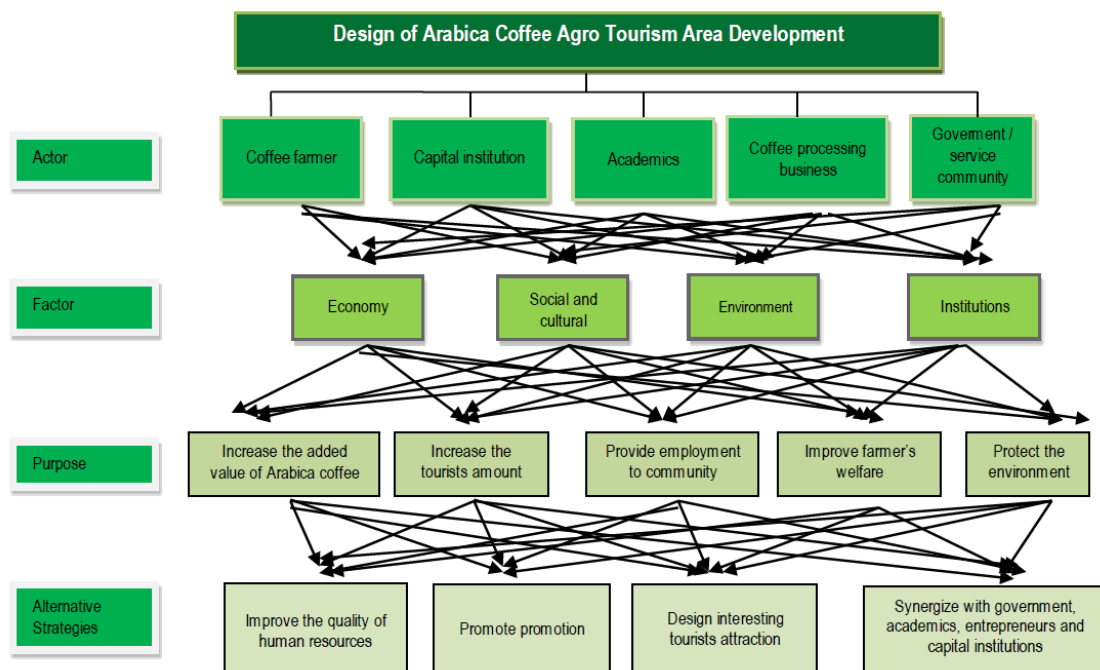
ability/competence in the related field and having knowledge in the field. Experts numbered 18 people consisting of local governments, community leaders, academics, capital institutions, coffee processing businesses and coffee farmers as well. The government consists of the Office of Agriculture for Food Crops, the Office of Tourism and Culture, the Office of Industry and Trade and the Regional Planning Agency in the Kabupaten Bangli which is related to the development of coffee agro-tourism in Kecamatan Kintamani.

2.3. Analytical Hierarchy Process (AHP)

AHP is a decision-making method for modeling complex problems in a hierarchical structure that shows the relationship of resolution. AHP can be used to measure the relative impact of many factors that influence the possible outcomes and thus predict the results. This prediction is then used when evaluating alternative actions. AHP pairwise comparisons to capture judgments of the priority decision elements which is regarding each parent criterion. A combination of comparative judgments can be organised in a matrix. Priority comes from the matrix as an eigenvector of the right priority process. This also allows for the measurement of inconsistencies in an assessment. The strength of AHP is its ability to detect inconsistent judgments. The limitation of AHP is that AHP only works with matrices with all the same mathematical forms and is known as positive matrix reciprocity. Analytical Hierarchy Process (AHP) is a pairwise comparison process based on hierarchy. AHP is a complex decision process that can be broken down into smaller decisions that can be handled easily (Marimin 2004). The main objective of the AHP is to rank the alternatives which is available by weighting the attributes and sub attributes used (Cabrera, 2009 in Abdullah, 2012). Graphically, the AHP decision problem can be constructed as a multilevel diagram (hierarchy). AHP starts with the first level goal criteria, sub-criteria and as a final point of alternatives (Marimin 2004).

In the preparation of the hierarchical process there are three basic principles of logical analysis according to Saaty (1993), how to relate the three basic principles to a new design decision making, namely: (1) hierarchical preparation, describing hierarchically the problem to be resolved into elements which separate elements, (2) prioritization, priority differences and synthesis, i.e. ranking elements according to relative importance, (3) logical consistency, ensuring that all elements are logically grouped and ranked consistently according to logical criteria.

Figure 1. Hierarchy diagram of Arabica Coffee Agro Tourism Development in Kecamatan Kintamani, Kabupaten Bangli



Evaluation of Criteria and Alternatives

In this process, pairwise comparison is performed between various criteria with two important stages, namely: (1) determining which of the two is considered important and (2) determining how many times more important. The priority of the set of criteria and alternatives is determined by comparing each other in pair which are weighted in the form of a scale of 1 to 9 with the definition of each scale.

Consistency of the Matrix

The consistent matrix if the weights of the intersecting comparisons have the following cardinal and ordinal relationships:

Cardinal Relationship: $a_{ij}, a_{jk} = a_{ik}$

Ordinal Relationship: $A_i > A_j; A_j > A_k$ then $A_i > A_k$

If the main diagonal of the matrix is 1 (one) and consistent, then a small deviation from a_{ij} will still show the largest eigenvalue, which is where the value is close to n and the remaining eigenvalue will be close to 0 (zero).

Saaty (1993) suggests using a Consistency Index (CI) and Consistency Ratio (CR) to ensure the consistency of the CI and RI matrix comparisons is defined as follows:

$$CI(\text{Consistency Index}) = \frac{\lambda_{\max} - n}{n - 1}$$

where: λ_{\max} = maximum eigenvalue
 N = matrix size
 CI = consistency index

Random Index (RI) is a random index value based on matrix size (n) used for Consistency Ratio (CR).

$$CR = \frac{CI}{RI}$$

Values from RI represent the average of the consistency index randomly for the same order of entries from the reciprocal matrix. If the value of $CR < 0.1$, then the estimated one can be accepted, if not, a new comparison matrix is needed for $CR < 0.1$.

Table 1. Random Index Value

UM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.59

Source: Saaty, T.L. 1993

Hierarchy Consistency Calculation

$CCI = CI1 + (EV1), C12$

$CRI = RI1 + (EV1), R12$

$CRH = CCI / CRI$

where: CRH = Hierarchy Consistency Ratio

CCI = Hierarchy of Consistency Index

CRI = Random Hierarchy of Consistency Index

$CI1$ = consistency index of comparison matrices passed to the first level hierarchy

$CI2$ = consistency index of comparison matrices passed to the second level hierarchy

$EV1$ = Priority value of the comparison matrix passes to the first level hierarchy

$RI1$ = random consistency index from the comparison matrix of meeting the first level hierarchy (j)

$RI2$ = random consistency index of comparison matrices passed to the second level hierarchy ($J + 1$)

Seven Pillars of AHP

1. Pairwise comparisons

Pairwise comparisons aim to produce alternative weights between criteria or between alternatives so that priority will be obtained.

2. The sensitivity condition of the eigenvector

The sensitivity of eigenvectors to changes in criteria limits the number of elements in each set of comparisons. Therefore, this requires the equality of each element concerned.

3. Ratio Scale

Ratio is comparing the value of (a) and the value of (b) which has (a) type or unit. Ratio scales are a number or a group of ratios that are consistent or unchanged at the same change status. The ratio scale is the only way to generalize a decision technique.

Tabel 2. Tabel Saaty Scale

Assessment of one object to another	Value
The same level of importance	1
Weak interest level	3
Strong level of importance	5
The level of importance is very strong	7
Extreme Interest Level	9
The middle value between two adjacent values	2,4,6,8
If object (i) gets one of the above values when compared to object (j), then object (j) gets the inverse value when compared to object (i).	

Source: Saaty, 1993

4. Homogeneity and clustering

The clustering method is used if there are more than one degree between elements. In order to widen the fundamental scale gradually and eventually magnify the scale 1-9 to 1- infinity.

5. Synthesis

Synthesis is applied to the ratio scale to create a multi-dimensional scale which aims to describe the overall expenditure using additional weighting.

6. Maintain and reverse the order

The weighting and order of the hierarchy is influenced by the addition of criteria and alternatives to the reversal of the order in alternative measurements.

7. Group considerations

The AHP method can be made possible to use the mindset interaction considerations for each individual involved.

3. Results and Discussion

Actors (stakeholders) involved in the design of Arabica Coffee agro-tourism development, namely coffee farmers, capital institutions, namely Bank BPD, academics, coffee processing businesses and local governments, namely the Office of Agriculture and Food Security, the Office of Tourism and Culture, the Office of Industry and Trade and the Regional Planning Agency (Bappeda) in Kabupaten Bangli. This actor was elected based on the opinion of the respondents. At the actor level, the most instrumental in the development of Arabica coffee agro-tourism in Kecamatan Kintamani, Bangli are coffee farmers with a value of 0.338 and capital institutions with a value of 0.244. This illustrates that coffee farmers are subjects in coffee agro-tourism because coffee agro-tourism in the Kintamani is based on Arabica coffee plantations owned by *Subak Abian* whose members are coffee farmers.

Subak is a peasant organization in Bali which is a customary law community unit, which is socio-agrarian, religious, economic and dynamic that has a certain area and its own wealth and has the right to manage its own household (Bali Provincial Cultural Office, 1995 in Budiasa, 2010). *Subak* systems are generally for wetland or paddy agriculture, whereas for dry land known as *subak abian* (Budiasa 2010). The *subak abian* system organizes small farmers very well. This traditional system is based on Hindu philosophy, Tri Hita Karana. This philosophy teaches about harmonious relations with the environment which is encouraging farmers to reduce the use of chemicals, therefore organic coffee is produced. According to (Sedana 2014) the development paradigm must lead to agriculture (farmers), that is, with the development of sustainable and dynamic *subaks* as long as it is still recognized that the majority of the population working in the agricultural and agricultural sectors is one of the cultural assets of Bali.

The capital institution involved in the development of coffee agro-tourism in Kintamani is the Regional Development Bank (BPD) of Bangli. Bank support as a capital institution provides non-financial contributions in the form of improving footpaths in the agro-tourism tracking area, providing coffee processing assistance and assisting in organizing exhibitions of district-level agricultural products which are held annually. The involvement

of this capital institution is very helpful for the community especially stakeholders in coffee agro tourism in promoting and introducing Kintamani Bali Arabica Coffee. As said by Batubara (2007), in general financial institutions in Indonesia include state-owned commercial banks (BUMN), regional development banks (BPD), rural credit banks (BPR) and non-bank financial institutions. These financial institutions are still very limited which is solemn and consistent in financing the agricultural sector.

Figure 2. Priority Value Stakeholders (actors) Development of Arabica Coffee Agro Tourism in Kabupaten Bangli



Inconsistency 0,01

At the level of the most dominant factor in the development of Arabica coffee agro-tourism is the economic field with a value of 0.327 and social culture with a value of 0.291. The positive impact caused by the economic life of the community both directly and indirectly as said by Leiper (1990) is that tourism can engage labor, many individuals be influenced by their lives from the tourism sector. Utama (2011) states agro-tourism is a substitute tourism which is a massive solution in insufficiency alleviation. Lobo *et al.* (1999) states that the development of agro-tourism can produce opportunities for local farmers to increase income and improve living standards. Agro-tourism is related to tourism activities which are at the same time learning for tourists. Get to know more closely the production process in the agricultural sector and make the agricultural region as a place to enjoy agricultural products directly, as well as buying and enjoying agro-tourism products, therefore it can contribute to the surrounding community to increase income. Some positive impacts of agro-tourism development include increasing the selling value of agricultural commodities produced and developing other sources of income that can be appreciated by the community (Palit *et al.* 2017). Besides that, as stated by Sastrayuda (2010) that agro-tourism that is well adopted will have an impact on improving the community's economy in the form of community income, employment and business opportunities.

Figure 3. Priority Value of Arabica Coffee Agro-tourism Development Factors in Bangli



Inconsistency 0,01

Figure 4. Priority Value of the Development Goals of Arabica Coffee Agro-tourism in Kabupaten Bangli



Inconsistency 0,00878

For socio-cultural factors that play a role in the development of coffee agro-tourism in Kintamani Bali is the attraction of picking red coffee beans (cheri coffee) in the coffee plantation area. Tourists who come to the coffee agro-tourism location are invited to do tracking (along the Arabica coffee plantation area) and are introduced to how to process coffee from red coffee beans (cheri coffee) to coffee grounds and how to ferment

Arabica coffee to produce specialty Arabica coffee. As said by Howe (2005), tourism culture is a culture based on the needs of tourists. Interaction of tourists with local communities requires a list of basic needs and supporting tourists in carrying out tourism activities. Pitana (1999) states that the factors that cause socio-cultural impacts in tourism are the dominant objects that become tourism offerings and tourist needs related to these offerings as well as the characteristics of the tourist attractions presented, whether natural, archeological sites, or social culture.

At the level of objectives expected from the development of Arabica coffee agro-tourism is to increase the added value of Arabica coffee with a value of 0.339 and provide employment for the community with a value of 0.207. WTO (1980) identified the positive economic impact in improving the community's economy is that tourism can increase the demand for local agricultural products. Tourism will encourage farmers to learn new techniques in producing food. Tourism will encourage the emergence of food processing businesses which increase the added value of local agricultural products. Coffee processing is very important in determining the quality and taste of coffee (Rahardjo 2012). Broadly speaking, coffee processing based on how it works can be divided into two ways, specifically wet processing and dry processing (Geographical Indication Requirements, 2011). The main difference between the two methods is the way it is processed by wet milling (Wet Process-WP) and dry milling (Dry Process-DP). For Kintamani Bali Geographical Indication coffee, wet processing is needed, because the coffee fruit (cheri coffee) which is processed in wet is red coffee and when mining (washing) in the water manually the coffee will sink (meaning). Coffee fruit is of good quality and included in grade I or grade II. While the coffee fruit is not good (inferior) it will float on the water, it means that the quality of the coffee is low and come into grade IV to grade VI. Thus it will be processed by dry method. In wet milling processing, the mechanism in processing coffee needs to be considered well in order to gain good coffee quality and may rise the added value of coffee products.

The priority value at the objective level with the second highest value is providing employment for the community at 0.207. Agro-tourism development will improve the welfare of the community through the provision of employment opportunities such as cultivating agricultural land in agro-tourism objects and exploiting opportunities from the presence of tourists in providing services and products to meet the needs of tourists (Swastika *et al.* 2017). In the coffee agro-tourism in Kintamani Bali, people produce specialty ground coffee with various options of coffee flavors such as honey coffee, wine coffee. Kintamani natural wash coffee is for sale to guests or tourists visiting the Kintamani Arabica Coffee agro-tourism. This offer may able to absorb labor to increase economic life of the surrounding community. According to Subowo (2002) in (Palit *et al* 2017), the development of agro-tourism will create jobs which increase income and improve the welfare of farmers.

At the alternative level, the highest priority strategy in developing Arabica Coffee agro-tourism in Kintamani Bangli is to improve the quality of human resources with a value of 0.436. Pitana and Diarta (2009) where human resources are recognized as one of the vital components in tourism development. Almost every stage and element of tourism requires human resources to move it. Sastrayuda (2010), states that human resources are the management of tourist attraction objects, because the human resources needed are in the form of extensive knowledge in agriculture and skills in farming. Attitudes towards work handled must be an important part of resources humans who work on objects of agro-tourism destination areas. As stated by (Pajriah 2018), that the role of human resources is very supportive of the success for the development of cultural tourism with its competence, therefore cultural tourism objects become more attractive and unique destinations. Those are beneficial for people who are in tourist areas to improve their welfare.

The Arabica Coffee farmers who are members of the *subak Abian* in Bali Kintamani Coffee Agro Tourism have had knowledge and experience in managing coffee plantations for many years and are very well aware of the cultivation to ins and outs of Arabica coffee plants. This is a capital to explain to tourists who come to coffee agro-tourism as a source of information and experience for tourists. Besides, human resources stakeholders involved in Arabica coffee agro tourism already have the skills and abilities and good knowledge in providing services and information to tourists for the development of agro-tourism.

The second highest alternative level is to support promotion with a value of 0.226. As said by (Wolah 2016), that tourism promotion influences the process of providing information to tourists and promotion is very instrumental in increasing tourist visits. Sastrayuda (2010), states that with the development of agro-tourism in an area will be encouraged to become famous and become the attention of tourists to visit. The impact is quite interesting that there is a link between agro-tourism and tourism promotion. Promotions that have been carried out at the Kintamani Bali coffee agro tourism are by using brochures, websites, as well as participating in product exhibitions which are carried out annually by local governments in the Kabupaten Bangli and in the Province of Bali such as exhibitions at the Bali Arts Festival (PKB) held every year.

Figure 5. Alternative Priority Value of Arabica Coffee Agro Tourism Development Strategy in Bangli

Improve the quality of human resources		0,436
Promote promotion		0,226
Design interesting tourists attraction		0,189
Synergize with government, academics, entrepreneurs and capital institutions		0,149

Inconsistency 0,01

Conclusion

Agro-tourism development strategies based on factors, objectives and system development strategies show that:

- The main actor involved in developing Arabica coffee agro-tourism is coffee farmers who are subjects in coffee agro-tourism because in coffee agro-tourism in the Kintamani based on Arabica coffee plantations owned by *Subak Abian* where the members are coffee farmers.
- The most dominant factor level in the development of Arabica Coffee agro-tourism in Kintamani is the economic field. Agro-tourism is related to tourism activities in which there is a production process in the agricultural sector and makes the agricultural area as a place to enjoy agricultural products directly, as well as buying and enjoying agro-tourism products. Therefore, it can make an economic impact to the contiguous community to increase earnings.
- The main objective expected of the Arabica Coffee agro tourism development strategy is to increase the added value of Arabica coffee. For Kintamani Geographical Indication coffee, the processing is done by wet processing, where the raw material is red color coffee. Wet processed coffee produces good quality and is included in grade I or grade II.
- The development strategy which is the highest priority in Arabica Coffee agro-tourism in Kintamani is to improve the quality of human resources.

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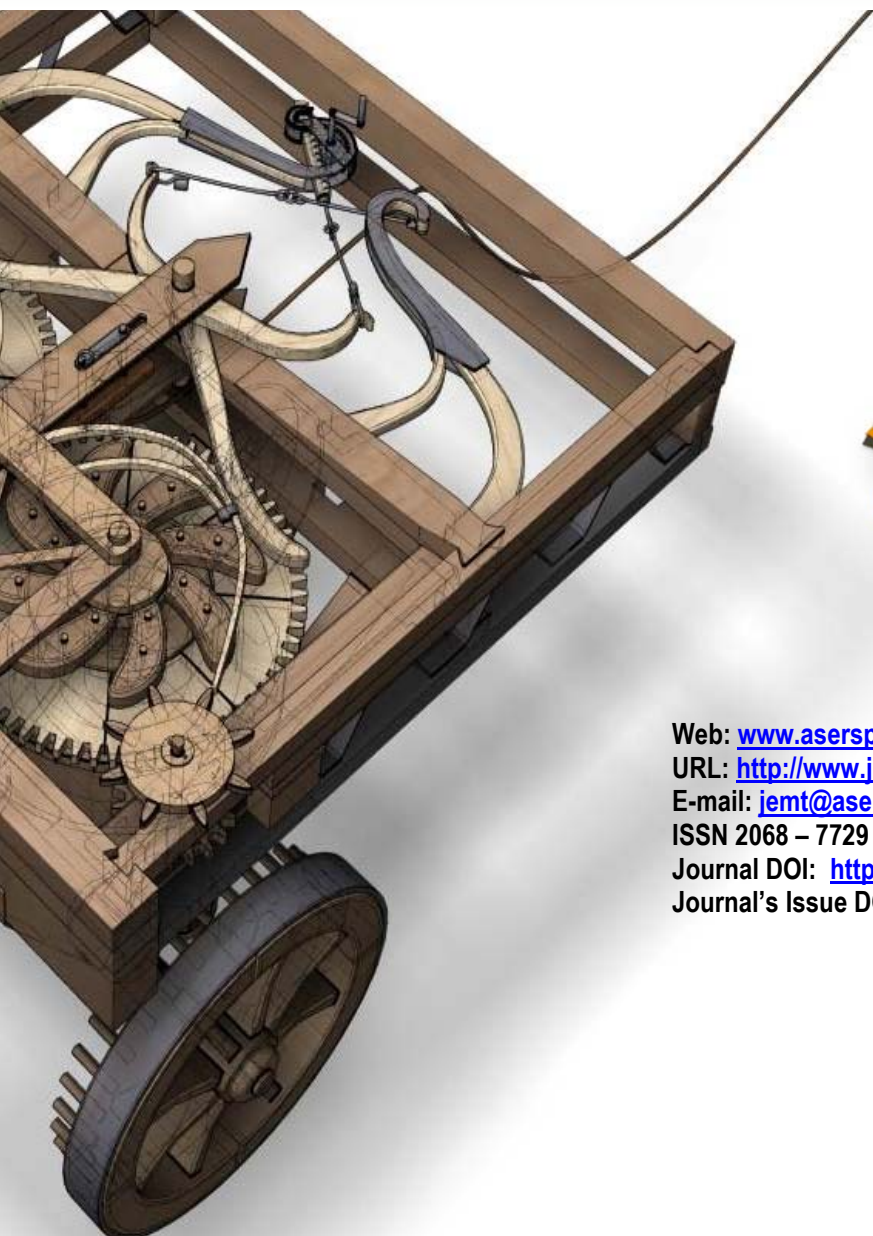
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