A HYBRID GROUP DECISION - MAKING APPROACH FOR PRIORITIZING REGIONAL DEVELOPMENT PROGRAMMES IN SOUTH SULAWESI PROVINCE, INDONESIA

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ASIA e UNIVERSITY
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ABSTRACT

This research developed a Group Decision Support System (GDSS) to support decision makers in ranking the regional development programmes for South Sulawesi Province in Indonesia to overcome the development gap towards national development stability. Determining regional development programs in Indonesia necessitates the involvement of multiple decision-makers (DMs), including the government, investors, universities, community organizations, and non-governmental organizations, to facilitate group decision-making. There are always procedures involved when using a decision-making system, especially when deciding which regional development program to be prioritised among several possible alternatives. Implementation of the regional development programmes in Indonesia has not fully taken into account the scale of priorities and elements of justice. In carrying out regional development programmes, it was found that there are development programmes that were prioritized, actually not according to regional development criteria. This has resulted in regional development programmes in Indonesia not in accordance with the targets to be achieved. Hence, it would cause development gaps, which impacted on national development stability. Determining regional development program priorities often does not pay attention to whether there is a link with the target indicators set in The Medium-Term Regional Development Plan (RPJMD). This results in budget inefficiencies, social injustice and unsustainable programs. Therefore, the objectives of this research are :- to identify a new ranking model for prioritising regional development programs in South Sulawesi Region, to develop a new decision-making technique for Decision Makers in determining the priority scale according to the criteria set out in the regional development program in South Sulawesi Province, to develop a new group decision making technique for a group Decision Maker in determining priorities which are aligned with the specified criteria in the regional development program in South Sulawesi Province and to validate the developed Group Decision Support System in identifying the priority in regional development programs. This research developed Group Decision Support System based on decision ranking models for regional development program namely AHP, ELECTRE, ARAS, AHP+ ARAS, AHP+ELECTRE, ELECTRE+ARAS, and AHP+ELECTRE+ ARAS. Based on the accuracy test, it was found that GDSS based on hybrid AHP + ELECTRE + ARAS method resulted in the highest accuracy which is 86.67%. The prioritised regional development programs obtained from the developed hybrid AHP + ELECTRE + ARAS Group Decisions Support System were also validated by experts review which show strong correlation. The prioritised regional development programs determined from the developed Group Decisions Support System will be used as recommendations for regional development programs implementation.

Keywords: Group decision support system, analytical hierarchy process, elimination and choice translation reality, additive ratio assessment

APPROVAL

This is to certify that this thesis conforms to acceptable standards of scholarly presentation and is fully adequate, in quality and scope, for the fulfilment of the requirements for the degree of Doctor of Philosophy.

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(25 July 2024)

DECLARATION

I hereby declare that the thesis submitted in fulfilment of the PhD degree is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that the material has not been submitted either in whole or in part, for a degree at this or any other university. In making this declaration, I understand and acknowledge any breaches in this declaration constitute academic misconduct, which may result in my expulsion from the programme and/or exclusion from the award of the degree.

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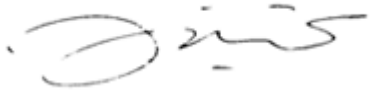

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LIST OF ABBREVIATION

AHP	Analytical Hierarchy Process
ARAS	Additive Ratio Assesment
ELECTRE	Elimination and Choice Translation Reality
DM	Decision Maker
NGO	Non Govermental Organization
MCDM	Multi Criteria Decision Making
GDSS	Group Decision Support System
DSS	Decision Support System
RO	Research Objective
RQ	Researc Question
PS	Problem Statement
DBMS	Database Management System
MBMS	Model Base Management System
GUI	Graphical User Interface
GDM	Group Decision Making
LLS	Logarithmic Least Square
WGM	Weighted Geometric Mean
CMS	Content Management System
LGDM	Large Group Decision Making

RKPD	Regional Government Work Plan
	(In Indonesia Rencana Kerja Pemerintah Daerah)
SKPD	Provincial Regional work unit
	(In Indonesia Satuan) kerja perangkat daerah).
RPJMD	Regional Medium-Term Development Plan
	(In Indonesia Rencana Pembangunan Jangka Menengah Daerah)

CHAPTER 1

INTRODUCTION

This section discusses the research background, problem under study, research questions and objectives, operational definition, justification and relevance, and organization of the Thesis.

1.0 Background of the Study

Regional autonomy is one primary tool that allows local administrations to run their matters. As this suggests, the central government has given way to regional administrations regarding authority. 2014's Law No. 23 about regional administration contains representation authority. These laws and regulations demonstrate how regional autonomy has created a new model for regional administration by giving local administrations a great deal of power and responsibility. This enormous power and duty were anticipated to motivate people and increase regional potential (Sitohang & Febriyanto, 2021). In order to maximize development and economic growth, Indonesian local governments are expected to exercise greater creativity in managing and utilizing their regional potential. Thus, it is imperative that development planning be done correctly in Indonesia and that different aspects of it be considered when considering localized growth problems (Iskandar, 2023). An issue that frequently arises during the execution of localized growth procedures in Indonesia is that the components of justice and the hierarchy of priorities have not been properly taken into account when formulating regional of development initiatives. Development programs may arise during the implementation of regional development that are prioritized differently from the regional development criteria.

As a result, Indonesia's regional growth did not meet the set goals, creating development gaps that have an effect on the stability of the country's development. In

Indonesia, regional development is not necessarily equitable; certain regions expand quickly while others grow more slowly. It is imperative that all sectors of the economy improve, particularly those deemed developing nations like Indonesia (Karim, 2018). An example of the economic growth of South Sulawesi province in 2018-2022 can be seen in Table 1.1.

Table 1.1: Economic growth by regency/city of South Sulawesi province 2018-2022

No.	Kabupaten/ Kota	Pertumbuhan Ekonomi (%)				
		2018	2019	2020	2021	2022
1	Kep. Selayar	8,75	7,68	-1,78	4,02	3,67
2	Bulukumba	5,05	5,49	0,43	4,76	3,81
3	Bantaeng	8,13	10,75	0,52	8,86	15,45
4	Jeneponto	6,29	5,47	0,16	5,4	3,81
5	Takalar	6,66	6,87	-0,61	5,05	4,64
6	Gowa	7,14	7,46	1,76	7,26	4,59
7	Sinjai	7,44	6,12	1,55	5,23	4,87
8	Maros	6,19	1,24	-10,87	1,36	9,13
9	Pangkep	4,76	6,41	-1,69	3,46	4,93
10	Barru	7,11	7,41	0,87	4,77	5,11
11	Bone	8,91	7,01	-0,25	5,53	5,23
12	Soppeng	8,11	7,69	2,19	6,15	6,18
13	Wajo	1,08	4,06	-1,17	6,77	2,38
14	Sidrap	5,02	4,65	-0,59	5,54	4,86
15	Pinrang	6,91	6,53	0,44	5,04	4,52
16	Enrekang	3,26	5,43	1,25	6,36	3,71
17	Luwu	6,86	6,26	1.3	6,03	5,69
18	Tana Toraja	7,89	7,22	-0,28	5,19	5,12
19	Luwu Utara	8,39	7,11	-0,59	3,9	4,54
20	Luwu Timur	3,39	1,17	1,46	-1,39	1,99
21	Toraja Utara	8,07	7,56	0,17	4,05	5,27
22	Makassar	8,42	8,79	-1,27	4,47	5,4
23	Parepare	5,58	6,65	-0,08	4,41	5,93
24	Palopo	7,52	6,75	0,45	5,41	5,83
Sulawesi Selatan		7,04	6,91	-0,71	4,64	5,09

Sumber: Badan Pusat Statistik Provinsi Sulawesi Selatan, Tahun 2019-2023

Development can not only be interpreted as development in the infrastructure sector, development also includes the development of human resources, tourism, water resources, the economy, and so on. According to (Hasan & Azis, 2018), "Development is an effort to expand the real freedom enjoyed by the people so that expanding freedom is seen as the main goal of development". In carrying out Development, every regional government needs a development plan with the aim that each Development can assess what is being built and has a precise influence. Often the planning for development submissions proposed by the regions do not pay attention to the level of

urgent needs, the existing budget, or even whether whether the development is linked to the target indicators that have been regulated in the RPJMD (Regional Medium Term Development Plan) or not (Iskandar, 2023). Therefore, it is necessary to conduct an assessment of the priority scale by taking into account the factors that influence development planning.

A set of priority programs that are mainly tied to the accomplishment of regional development goals, the degree of urgency, and the leverage for enhancing regional development performance are known as regional development priorities. Developing development priorities involves assessing regional development issues connected to regional development plans as outlined in the planning year's draft RPJMD Review. The annual regional government development agenda, or regional development priorities, is a step toward reaching each of the five (five) annual RPJMD targets. Superior SKPD initiatives with the highest realization for reaching regional development targets for the planning year are among the regional development priorities. Development priorities can also be classified as operational regional strategic objectives, considering the extent of development and the urgency of leveraging on welfare. Programs classified as priority by SKPD are those that pertain to meeting fundamental needs and minimal service criteria and either directly or indirectly assist in accomplishing regional development priorities. Only some priority initiatives can be a top priority for regional development. Budgetary constraints and the outcomes of identifying the issues at hand are the causes of this.

Determining regional development programs in Indonesia necessitates the involvement of multiple decision-makers (DMs), including the government, investors, universities, community organizations, and non-governmental organizations, to facilitate group decision-making. The aim of involving various stakeholders is to

determine regional development strategies while considering applicable laws and regulations. There are always procedures involved when using a decision-making system, especially when deciding which regional development program to choose or prioritise among several possible alternatives. When it comes to time and decisions that take more time to make quickly, professionals strive to create efficient methods for deciding on regional development programs. Expert viewpoints are always one of the options from the suggested solutions that can be taken into consideration. Decisions will also be diverse due to the diversity of backgrounds and competencies among specialists. As a result, several techniques have been created and developed to gather expert viewpoints and present the most excellent solution among the options presented. It is also required to mix existing and additional methods based on the methods employed individually or in groups to fit the decision-makers parameters and interests. The requirements or parameters generate different result judgments for every interest on every option the DM produces. The decision-making procedure is always swift, precise, and objectively carried out. These techniques have been applied to the DSS to generate options that satisfy the standards established by a firm or organization. Every study describes the benefits and drawbacks of the many approaches used, and advancements are inevitably made based on these studies. One method commonly employed in DSS is the Analytical Hierarchy Process or AHP. DSS, which means examining and considering several requirements that verify several current standards, has been extensively used in the industrial sector. The AHP approach is the strategy for assessing both qualitative and quantitative criteria (Akincilar & Dagdeviren, 2019). The AHP approach is a Multi-Criteria Decision-Making (MCDM) strategy that is particularly effective at modelling expert opinions in the Decision Support System. (Zahira & Zahira, 2023). Combining another

method with the AHP method is necessary to achieve more successful outcomes because the AHP approach has limitations. Specifically, it is ineffective when employed in circumstances with many criteria and possibilities. (Fatmawati et al., 2023; Wicaksono et al., 2020),

Because the AHP approach offers benefits according to a pairwise comparison matrix by carrying out a study of consistency, this research integrates the Elimination and Choice Translation Reality (ELECTRE), Additive Ratio Assessment (ARAS), and AHP approaches.The ELECTRE method is employed when adequate alternatives can be developed, and alternatives that do not satisfy the requirements are removed (Mada et al., 2023). Examining and ranking alternative selections is made simpler by the ARAS approach, which compares alternatives with more options for produce the finest and optimum results (Surbakti et al., 2023). The ARAS method can determine priority alternatives based on the value of their utility function. This research uses the hybrid AHP + ELECTRE + ARAS method using a modified ranking method that can support collective decision-making. This study aims to determine a regional development program in South Sulawesi Province, Indonesia, by developing a group decision-making model that blends the AHP, ELECTRE, and ARAS methodologies.

1.1 Problem Statement

This study's problem statements are:

Implementation of the regional development process in Indonesia has not fully taken into account the scale of priorities and elements of justice in determining regional development programs (Karim, 2018). In carrying out regional development programs, development programs that are prioritized not according to regional development criteria may occur. This results in regional development in Indonesia is not in accordance with the targets to be achieved so it can cause development gaps that

have an impact on national development stability. Regional development in Indonesia is not always fair so that some regions experience rapid growth, while other regions experience slow growth. Determining regional development program priorities often does not pay attention to whether there is a link with the target indicators set in The Medium-Term Regional Development Plan (RPJMD) (Iskandar, 2023). This results in budget inefficiencies, social injustice and unsustainable programs.Determination of regional development programs in Indonesia does not use logical consistency as an assessment in determining priorities for regional development programs (Sari & Nasution, 2023). Determining regional development programs does not give weight to each criterion, so it does not reflect the level of importance of each criterion in the decision-making process (Wati et al., 2023). Determining priorities for regional development programs does not use the degree of utility, namely comparing the overall index value of each regional development program with the optimal regional development index value (Ramadhani et al., 2022). Determining regional development programs does not comprehensively compare alternative regional development programs, resulting in an unbalanced or unfair assessment of various programs. The determination of regional development programs in Indonesia still uses the manual method, because each DM must be present at the same place and at the same time, this causes the determination of the regional development program to take a little or quite a long time. Manual processes tend to be slower and take a long time, this can hinder rapid response to changes in situations and community needs.

1.2 Research Questions

The study's research questions are listed below:

i. What are the criteria of evaluation in determining the priorities for regional development programs?