Ethnobotanical knowledge and vitality of Gayo ethnolinguistic in Jabodetabek, Indonesia

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Abstract. Each time a language dies, so do certain plant species. Gayo is classified by Ethnologue as an endangered language, yet Gayo Highland of Aceh harbors rich plant diversity. The language vitality would provide insight into the potential plant conservation efforts within the original geographic site. This research documented the ethnobotanical knowledge of the Gayo diaspora residing in the urban cities of Jabodetabek, Indonesia, and assessed the language vitality. Ethnographic interviews were used in a one-day Focus Group Discussion engaging 10 knowledgeable Gayo elders from various backgrounds and 1 Gayo ecolinguistic expert. The plant list was then compared to the Gayo plants identified from various publications. The language vitality was determined using UNESCO Language Vitality Assessment and EGIDS. FGD and in-depth interview documented 143 plant species with 39.5% new addition to the previous 218 species recorded based on literatures. The language intergenerational transmission indicated that most children still speak Gayo as their first language but are restricted to a specific domain. The results of this research confirm the potential role of the Gayo diaspora of Jabodetabek in maintaining and possible revitalization of the Gayo language and is expected to produce an initial step for plant conservation in the Leuser Ecosystem.

1. Introduction

“When an old man dies, a library burns to the ground” is an old African proverb, which is philosophically understood by many people around the world. The nature of knowledge that is orally passed down through generations, rests in the hands of the elders, as they are the most knowledgeable [1-3]. Elders, whose knowledge and experiences had the greatest time-depth, are most of the time the guardian of a culture [3]. Years of experiences and interaction with nature are often expressed through language. As the DNA of a culture [4], language can be understood by understanding language [5]. Therefore, intergenerational transmission of knowledge and language between Elders and youth is a crucial link that should be preserved [6].

Language plays a very important role in passing on information about the environment, known as traditional knowledge (TK). Specific features of TK include: oral in nature, transmitted intergeneration, belong to a specific group of traditional people, and accumulative representing a history of experiences, careful observations, and experimentation [7], but often remain undocumented [8]. Loss of languages is an indicator of loss of cultural diversity and TK. Various research shows that the TK of plants (ethnobotany) holds the key to the preservation and conservation of plant biodiversity. Therefore, the vitality of a heritage language (or dialect) largely depends on whether that language (or dialect) could
be passed on to the next generation [9]. Put simply, TK must be spoken for the heritage to live on. Unfortunately, TK is rapidly disappearing. Reference [10] made an estimation that between 60% and 90% of the world’s languages will have disappeared within a century.

As one’s setting develops, cultural changes take place very quickly, particularly when exposure to opportunities not available to their elders are experienced by the new generation, such as attending school [2,11-13], learning the national language, and migrating to urban areas [9]. As a result, [14] notes that TK is intimately connected to its area of origin, thus in order for the TK to be retained, the speakers must remain in situ. However, [5] brought up the fact that one of the current development in sociolinguistics is the realization that place does not define an individual or group, or even language behavior. This finding is supported by [5,15] through their research, which reveals that grandparents of migrant families constitute an important source of intergenerational language transmitters as they play a significant role in passing down the language inheritance to the next generation. As indicated by [16], first-generation immigrants still speak their mother tongue to the second generation of who are mostly bilingual, but the third generation only speaks the language of the host country. Language shift is also apparent among the minority of ethnic groups in multilingual settings as observed by [17]. According to [18,19], migrant communities provide central insights for understanding how time might change one’s ethnobotanical beliefs and practices, and the various environmental and societal factors affecting the changes over time or even the loss of such knowledge.

The parallels between species and languages have been noted and remarked upon since the 19th century, by Charles Darwin in The Descent of Man (1874) [20]. Research has shown that places of high diversity, especially tropical forests, have always been known to have high linguistic diversity, whereas tundra and deserts have low diversity. One of the highest plant diversified ecosystems is the Leuser Ecosystem (Kawasan Ekosistem Leuser – KEL) located in the Province of Aceh, Indonesia. Leuser makes up a greater part of the World Heritage Site of Tropical Rain Forest Heritage of Sumatra and is by far the largest and most significant forest remnant remaining in Sumatra [21]. Leuser ecosystem highly covered the Gayo Highland Area, which is inhabited by the people of Gayo (Urang Gayo). Unfortunately, the Gayo language is determined by Ethnologue as an endangered language. Considering the wealth of plants but endangered language, the role of the Gayo speakers must be encouraged. The presence of the Gayo diaspora outside the Gayo Highland could serve as a buffer and supporting groups in ensuring the continuity of the speakers. This is in line with the statement by [22] that diaspora communities need to be taken seriously as they can further language documentation, conservation, and revitalization. The objectives of this research were to record the ethnobotanical knowledge of the Gayo diaspora outside the Province of Aceh and to compare the collected ethnolinguistic data with previously published plant names from various ethnobotanical literatures in order as well as to assess the language vitality to determine the way forward for the maintenance and revitalization of Gayo (speakers, language and land).

2. Methods
2.1. Internal migration of Gayo people
The word Gayo refers to the people (urang Gayo), land (tanoh Gayo), and language (base Gayo). The spread of Urang Gayo within the tanoh Gayo (present-day Aceh Province) since 7500 years ago, has influenced the emergence of Gayo dialects, namely Gayo Lut (Central Aceh and Bener Meriah Districts) comprises of two sub-dialects, Cik and Bukit, Gayo Deret (Linge, Isaq, and its surroundings in Central Aceh District), Gayo Belang (parts of Southeast Aceh and Gayo Lues District), Gayo Lokop/Serbejadi (East Aceh District), and Gayo Kewat (Aceh Tamiang District).

The movement of Urang Gayo was first initiated by migrating to Java, the island of hope, in which the dignity of Gayo parents is measured on the ability to send their children off to Java. “Ari empet ngenaken lues, arinanyang ngenaken temas” (to seek better standards of living) is the underlying pull factor to migrate. There are five flows of migration periods: The first flow occurred prior to the Indonesia independence (1945), driven by a sense of nationality to fight for their homeland; the second flow was after Indonesian independence (1945-1950), which was more encouraged to enrich experiences on others’ land; the third flow (1950-1960) was based on the goal of filling independence in the form of seeking knowledge. During this period, the outflow of Gayo people especially students was increasingly
unstoppable. This time, the movement has gone beyond Java. The period 1960-1965 marked the fourth flow of migration and 1965 onwards, was the fifth flow. The goal was to continue higher education and work in various fields such as government and private sectors, as well as trading activities.

Currently, the second generation of Gayo migrants is roughly above 50 years old, while the third generation is in their 30-40s and fourth generation under 30 years. When interacting with each other, Gayo language is spoken among the first and second generations as means of in-group communication.

The Gayo diaspora in the urban cities of Jabodetabek (Jakarta, Bogor, Depok, Tangerang, and Bekasi) is the biggest Gayo diaspora with approximately tens of thousands of people compared to the approximated 30 people living in Jakarta in 1951. Therefore, this study focuses on the Gayo diaspora of Jabodetabek.

2.2. Methodology
Local plant knowledge underpins in part the choices people make, about what and where to collect plant resources. Data collection was intended to uncover the local knowledge on useful plants through oral history.

2.2.1. Focus group discussion. A one-day Focus Group Discussion (FGD) was conducted on 29 August 2020 and was led by one of the researcher team members (Syafitri Hidayati) and the Gayo ecologist (Yusradi Usman Al-Gayoni). All of the participants are over 20 years of age and a signed prior informed consent was obtained from each key informant. Men and women of Gayo shared a similar knowledge of plant names, although women are more knowledgeable on the use of plants. However, the relationships between Gayo culture and environment are often represented through traditional arts, such as saman (dance), syaer (poems), didong (performing arts), and melengkang (figures of speech), of whom men are the actors.

The transmission of a language within the Gayo community is very much dependent on the father. Considering these, the key informants in this FGD were all males. In total, the FGD involved 10 participants (key informants), of whom were selected according to criteria consistent with the particular topic of “useful plants”. In the context of this research, further eligibility criteria for the FGD participants are: (1) middle-aged (a minimum age of 60 years or possess high intensive use of the language; (2) first and second generation Gayo descent; (3) permanently residing in Jabodetabek; (4) had been living in the areas for at least 20 years; and (5) representing various backgrounds to add insights into useful plants from various perspectives (table 1).

| Informant | Background                        | Age | Sub-dialect | Length of Residency |
|-----------|-----------------------------------|-----|-------------|---------------------|
| 1         | Law                               | 54  | Lut         | 35                  |
| 2         | Geomorpholog/geographer           | 71  | Lut         | 40                  |
| 3         | Didong art player                 | 75  | Lut         | 37                  |
| 4         | Historian                         | 71  | Lut         | 50                  |
| 5         | Educator                          | 82  | Lut         | 44                  |
| 6         | Cleric                            | 70  | Lut         | 52                  |
| 7         | Artist/journalist                 | 54  | Lut         | 23                  |
| 8         | Shaman family                     | 59  | Lut         | 40                  |
| 9         | Cultural practitioner             | 74  | Deret       | 54                  |
| 10        | Traditional speech/performemelengkang | 50  | Lues        | 27                  |

Participatory techniques (listing) is used to ensure that all participants are involved in the conversation. Key informants were asked to recall plant names in the Gayo language and the sub-dialects to produce a list of plant local names. Prior to the FGD, a list of food plants found in Gayo Highlands was documented based on literature reviews from March 2020 until August 28, 2020. The FGD was then followed by an in-depth interview with the most knowledgeable participant (Mr. Hamid) using open-ended questions, which are used to add data to the list of useful plants. The resulting integrated list of
plants from the FGD and in-depth interview was then compared to the list produced based on literature reviews.

2.2.2. Language vitality assessment. In order to assess the vitality of the Gayo language, the participants were asked to fill up a questionnaire following the UNESCO Language Vitality Assessment Index (2003) to evaluate the language vitality and state of endangerment of the Gayo language in Jabodetabek. There are 9 criteria, each is graded between 1-5 (safe): 1) intergenerational language transmission; 2) an absolute number of speakers; 3) proportion of speakers within the total population; 4) trends in existing language domains; 5) response to new domains and media; 6) materials for language education and literacy; 7) community members’ attitudes toward their own language; 8) governmental and institutional language attitudes and policies; and 9) amount and quality of documentation. Six degrees of endangerment are distinguished from safe to extinct. The vitality was also assessed using the Expanded Graded Intergenerational Disruption Scale (EGIDS) [23] (table 2), which is determined by answering three key questions below, each with its correspondent EGIDS level. In both assessments, “extinction” is excluded, because Gayo language is clearly still being used.

# 1: What is the current identity function of the language (home and vehicular)
   If the answer is home go to # 3; if the answer is vehicular go to #2
# 2: What is the level of official use (international-0, national-1, regional-2, not official-3)
# 3: Are all parents transmitting the language to their children? (YES-4,5 or 6a go to # 4; NO-6b,7,8a,8b go #5);
# 4: What is the literacy status? (institutional-4, incipient-5, none-6a)
# 5: What is the youngest generation of proficiency speakers? (great grandparents-8b, grandparents-8a, parents-7, children-6b)

| Level | Label       | Description                                                                 | UNESCO  |
|-------|-------------|-----------------------------------------------------------------------------|---------|
| 0     | International | The language is used internationally for a broad range of functions.          | Safe    |
| 1     | National     | The language is used in education, work, mass media, government, nationwide | Safe    |
| 2     | Regional     | The language is used for local and regional mass media and governmental services. | Safe    |
| 3     | Trade        | The language is used for local and regional work by both insiders and outsiders. | Safe    |
| 4     | Educational  | Literacy in the language is being transmitted through a system of public education. | Safe    |
| 5     | Written      | The language is used orally by all generations and is effectively used in written form in parts of the community | Safe    |
| 6a    | Vigorous     | The language is used orally by all generations and is being learned by children as their first language. | Safe    |
| 6b    | Threatened   | The language is used orally by all generations but only some of the child-bearing generation are transmitting it to their children | Vulnerable |
| 7     | Shifting     | The child-bearing generation knows the language well enough to use it among themselves but none are transmitting it to their children | Definitely Endangered |
| 8a    | Moribund     | The only remaining active speakers of the language are members of the grandparent generation. | Definitely Endangered |
| 8b    | Nearly Extinct | The only remaining speakers of the language are members of the grandparent generation or older who have little opportunity to use the language. | Critically Endangered |

3. Results and discussion
This sub-section discusses the ethnobotanical knowledge of the key informants and the assessment of Gayo language vitality in Jabodetabek. Some insights into future preservation efforts of the Gayo language are forwarded, based on the concept of language preservation zone.
3.1. Ethnobotanical knowledge

As many as 334 species of plants found in Gayo Highland were documented from literature reviews (only four literatures were found), suggesting the lack of ethnobotanical research within the Gayo Highland. The total number of plants for all categories of utilization given in Figure 1a (total species = 567), does not total the number of species since one plant species might have several uses. The oldest documentation that can be found is based on fieldwork by van Steenis dated back in 1937 [24] as the first document on the flora of Gayo. However, Van Steenis documented plants within the area of what is now part of the Gunung Leuser National Park. Therefore, this list was excluded from this research since this research is related to plants that are often used by the Gayo people.

Figure 1a also shows that most of the research focussed on medicinal food plants which make up about 55.2% of all the species researched, compared to 35.1% food plant and 13.4% plants for ritual/ceremonies purposes. Different results were obtained for plant names based on FGD and in-depth interview. Although the key informants cited the names in their sub-dialects, nevertheless, for the purpose of this research, the various ethnominingistic plant names were used to add insights only into the wealth of the language, while data analysis will only take into account the name in base Gayo. The key informants all together can recall as many as 334 plant names with as many as 132 species are new addition (figure 1b) or 39.5%.

Unlike the plant species from the published works which comprised mostly of medicinal plants, the ethnobotanical knowledge of the Gayo people in Jabodetabek shows that they could recall food plants the easiest (67.1%) compared to 18.2% medicinal plants and 7.0% plants use for rituals/ceremonies. The low knowledge on medicinal plant usage is probably being replaced with modern pharmaceuticals. Such figures clearly suggest that the Gayo people use plants mostly for food purposes and medicines, indicating the high reliance on local ecology for sustainable living. Both results suggested that cultural values are also attached to the plants. The composition of the results is in line with the previous statement by [24] that culture relies heavily on the use of plants in all aspects of daily life, from food to medicine and religious purposes.

It is important to note that the informant age group that identified the most plants was over 70 years of age. This was somehow related to the interest of the informants, and the close relationship with culture (didong performer) and plants (shaman family). Nevertheless, as a whole, the backgrounds or occupations of the current key informants showed more significance in affecting the ethnobotanical knowledge than age. It was observed during the discussions, that the more knowledgeable informants have geography/geology background, didong player, artist/journalist, and shaman family. On the contrary, the informants that were the least able to recall plant names were those above 70 years old but have been living in Jabodetabek the longest. These results show that interactions with plants are the key
to retain ethnobotanical knowledge. Occupations that places someone closer to plants will result in higher ethnobotanical knowledge.

Some literatures [25] recognize cross-cultural marriages as one of the causes of a reduction in botanical knowledge. However, such a fact was not found to be too significant among the key informants. As many as 30% of the key informants are married to non-Gayo wives, however, during the discussion, most of the key informants were very informative of the plant names. Yet, informants that showed the least knowledge are married to Gayo wives. Thus it can be concluded, that cross-cultural marriage does not have any relevant effects on ethnobotanical knowledge among the Gayo diaspora community. According to [26], this could be accounted for the fact that within the Gayo family, the father is the leader. Therefore, the presence of a male Gayo leader in the family could account for a better opportunity in retaining the Gayo language.

3.2. Language vitality assessment

The results above indicated that the diaspora community of Gayo in Jabodetabek still retains a comprehensive amount of ethnobotanical knowledge. Such knowledge is still recollected, because most of the key informants are still keeping the language alive, by using base Gayo as in-group communication. However, caution must be taken, because the intergenerational transmission of the language to the third generation is decreasing as seen in table 3 below.

| 1st generation Informant | Age | Sub-dialect | Length of Residency | Language use within a family | Spouse | Children | Grandchildren |
|--------------------------|-----|-------------|---------------------|-----------------------------|--------|----------|--------------|
| 1 | 54 | Lut | 35 | Indonesia | Gayo & Indonesia | n.a. |
| 2 | 71 | Lut | 40 | Gayo | Gayo | Gayo & Indonesia |
| 3 | 75 | Lut | 37 | Gayo | Gayo | Indonesia |
| 4 | 71 | Lut | 50 | Gayo | Gayo | Indonesia |
| 5 | 82 | Lut | 44 | Indonesia | Indonesia | Indonesia |
| 6 | 70 | Lut | 52 | Gayo | Indonesia | Indonesia |
| 7 | 54 | Lut | 23 | Indonesia | Indonesia | Indonesia |
| 8 | 59 | Lut | 40 | Gayo | Gayo | Gayo & Indonesia |
| 9 | 74 | Deret | 54 | Gayo | Gayo & Indonesia | Indonesia but grandchildren are currently taught Gayo |
| 10 | 50 | Luas | 27 | Gayo | Indonesia | n.a. |

Wives are non-Gayo
Does not have grandchildren yet

The results provided in table 3 were then assessed using EGIDS, and the result indicates a level of 6b and status of threatened, meaning that the language is used orally by all generations but only some of the child-bearing generation are transmitting it to their children in the category. To further assess and evaluate the endangerment of the current status of the Gayo language within Jabodetabek, each key informant was asked to self-assess the use of Gayo language within the family and beyond, using the assessment criteria given by UNESCO.

It is stated in Based on the UNESCO language vitality assessment, the following results were obtained:

1. Intergenerational Language Transmission

One of the key factors in ensuring the continuity of language use is the level of transmission to the next generation. The actual averaged grade level given by the key informant is 4.5 or if rounded is 5. The key informants agree that the transmission of the Gayo language is at a safe level because Gayo is currently spoken by all generations. The language still persists, especially in Gayo Highland areas. The intergenerational transmission of the Gayo language seems uninterrupted. However, since the actual grade is 4.5, it could be said that the status of
intergenerational transmission is currently safe but leaning towards unsafe (4) because in Jabodetabek as the largest Gayo diaspora in Indonesia, not all children or families in Jabodetabek speak Gayo as their first language, although it may be restricted to specific social domains (such as at home where children interact with their parents and grandparents).

2. Absolute Number of Speakers
The number of speakers according to all informants if averaged is 245455 speakers.

3. Proportion of Speakers within the Total Population
In line with criteria number 1, the average grade from all informants is 4 meaning that its endangerment degree is unsafe. Nearly but not all of the community members speak Gayo.

4. Trends in Existing Language Domains
The resulting grade level is 3 with the degree of endangerment of the dwindling domain. Gayo language is losing ground and at home, parents start to use Bahasa Indonesia in their everyday interactions with their children. Parents and grandparents tend to use Gayo and Bahasa Indonesia because they understand and speak them. Some informants are also starting to teach Gayo to their grandchildren.

5. Response to New Domains and Media
The averaged grade level is 4 or in the degree of endangerment, it is robust/active. Gayo language is used in most new domains.

6. Materials for Language Education and Literacy
The total averaged grade level is 4. One of the authors of this paper (Yusradi Usman Al-Gayoni) is the owner of a publishing company and the biggest Gayo library in Indonesia. Therefore, written materials exist among the community of Jabodetabek. Whereas at school in Takengon (Central Aceh), according to the information of the Head of District Education Service, Gayo language is taught in primary school from grade 3. Therefore, the children are developing literacy in the language.

7. Governmental and Institutional Language Attitudes and Policies
Government has a significant role in sustaining the use of the Gayo language. The average grade level given by the key informants is 4 meaning the level of support is differentiated support. The language is spoken according to the sub dialects of the bearers. The government also encourages Gayo ethnolinguistic groups to maintain and use their languages, most often in private domains (home), rather and children of Gayo are being taught base Gayo in schools. The Gayo Highlands, since 2016 is also taken into consideration when developing the Provincial Spatial Plan. Gayo Highland also makes up a big part of the Leuser Ecosystem, which is a Biosphere Reserve. Such policy supports the existence of the Gayo community since the existence of tanoh Gayo is protected. In addition, the establishment of higher education institutions within the Gayo Highland could reduce the number of high school graduates to leave their homeland.

Furthermore, the existence of Ikatan Musara Gayo as the biggest and the lead organization of the Gayo community within Jabodetabek also plays significant roles. They tend to perform ceremonial events and other art performance events in Jabodetabek, which could increase the pride of being a Gayo among the generations especially. Even in one family, the grandchildren are very proud of the Gayo descent.

1. Community Members’ Attitudes toward Their Own Language.
All key informants stated their positive attitudes as members of the Gayo community (averaged grade of 5) and place a high value on the Gayo language and wish to see it promoted. A positive attitude is crucial for the long-term stability of the Gayo language. Gayo people are very proud of their heritage.

2. Amount and Quality of Documentation
The average grade is 3 with the nature of documentation is fair. Although everyday media is available (Lintasgayo online), but more everyday media, audio, and video are necessary.
3.3. Prospects of Gayo language maintenance and revitalization

A diaspora community has not much been seen as a potential way to maintain a language, let alone revitalize it, as stated by [22]. It is clear from the results of this research that the presence of Ikatan Musara Gayo as the basic organizational foundation of the Gayo diaspora in Jabodetabek is significant. As stated by [27] a speech community can assess their language situation and determine if required actions must be taken. For this purpose, [27] stated that the first six factors are useful.

The vitality of base Gayo, based on the above results clearly indicate that the language is still being actively spoken. The current development of tertiary education and national and international concerns on Gayo Highland are opportunities to maintain and revitalize the Gayo language. The people and area of the Gayo Highlands can be regarded as the core zone (the yolk) in ensuring the sustainable use of the Gayo language (Figure 2). This implies the significant role of local and regional governments within the Province of Aceh in ensuring the ecological protection of the tanoh Gayo and encouraging the use of the language to increase the prestigious value of base Gayo among the younger generations especially so that the number of urang Gayo speakers (penutur) can be increased.

![Figure 2. Zonation of Gayo speakers (penutur).](image)

The Gayo diaspora has an important role in ensuring the number of speakers increase. Those living within the buffer zone (the white egg) and support zone (the eggshell) such as those in Jabodetabek as the most outer layer of Gayo speakers have a crucial role in protecting the two more inner zones. As the residing place of these speakers becomes further away from the core zone, there are challenging threats to the survival of the language due to the presence of other more dominant language(s) and a more multilingual community. Currently, Ikatan Musara Gayo Jabodetabek as the strongest support zone finds that Gayo is mostly being spoken by parents and grandparents within their community. On the other hand, all of the key informants as key figures of the Gayo diaspora of Jabodetabek, support the sustainable use of the language. At this point, the community realizes that the Gayo language has the potential of being lost if nothing is done about the situation.

The key informants agree that the community is very much interested in reversing language shift and have expressed their supports to encourage the language revitalization efforts starting within their own community. To ensure intergenerational transmittance of base gayo especially to the third generation onwards, it is suggested that base Gayo must be learned - children, family, environment, neighbors, and society. Awareness of the use and preservation of the Gayo language must be built, as the entrance and key to the preservation of Gayo culture and civilization; Taught - formally through local and informal content: family, neighborhood, and community; and Spoken - children, family, neighborhood, and society, to form a Gayo-speaking environment.
4. Conclusion
This research highlights the important role of speakers outside the Gayo Highland in ensuring the maintenance and revitalization of the language, especially those in the most outer part of the layer as in the case of the Gayo diaspora of Jabodetabek. The use of ethnobotanical knowledge in gaining insights into the relationship between the speakers and nature proved that such knowledge can be used to provide an assessment of the vitality of the language and to measure the degree of language endangerment as previously highlighted by [28] and [29]. This research found that the ethnobotanical knowledge and the use of Gayo ethnolinguistic in naming local plants by the Gayo community in Jabodetabek still persist. However, care must be taken, since most of the speakers are currently parents and grandparents. The roles of the male urang Gayo must be encouraged as a potential language transmitter. This research finds that culture is the most dominant link to preserve the Gayo language and the Gayo ecosystem. Hence it is recommended that the existence of Gayo diaspora be used to promote and encourage cultural performances especially among the younger generations.

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