Ubar Kampung: indigenous knowledge and practice of medicinal, aromatic and cosmetic (MAC) plants used for the treatment of diabetes mellitus in the Tatar Sunda Region of West Java, Indonesia

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Chapter III RESEARCH METHODOLOGY

This chapter describes the methods used in this research. This study employs the 'Leiden Ethnosystems' Approach' methodology to study people's behaviour which consists of three basic concepts including the *Participant's View* (PV), the *Field of Ethnological Study* (FES) and the *Historical Dimension* (HD) (*cf.* Slikkerveer & Dechering 1995). The 'Leiden Ethnosystems' Approach' is fit for this study because the methodology is intended to document and analyse the knowledge-belief-practice complex of indigenous knowledge and their impact on the patterns of health care utilisation of the community through a comprehensive approach. This study allows a detailed analysis of the point of view of the participants, the cultural characteristics of the research area and the historical processes involved in current behavioural patterns.

Furthermore, this chapter explains the sources of data for analysis in this study, including the selection of the research area, population sample, research planning and piloting, research design and the methodology employed. In order to collect data on the basis of the Leiden Ethnosystems' Approach, the present study is combining qualitative and quantitative research methods, which as Aiglsperger (2014) argues, is 'demonstrably profitable'. A combination of qualitative and quantitative methods can be viewed as an approach which draws upon the strengths and perspectives of each method to provide a broader perspective on the complexity of the phenomena studied (*cf.* Ostlund 2010).

The analytical model is operationalised into seven blocks of independent variables to analyse the health care utilisation behaviour of different medical systems, namely the traditional, transitional, and modern medical system. Seven blocks of independent variables include: *socio-demographic, psycho-social, enabling, perceived morbidity, institutional, environmental,* and *intervening variables*. By the process of linking concepts into measurable phenomena, a structured questionnaire is formulated through a deduced process of steps from *concepts* to *variables* to *indicators* to *categories*, adapted from Slikkerveer (1990).

Finally, the chapter highlights the selected stepwise statistical analyses performed in this study, including bivariate analysis, multivariate analysis (OVERALS) and multiple regression analysis of the data, leading up to the ultimate model presented in Chapter VIII.

3.1 Selected Research Methodology

3.1.1 The 'Leiden Ethnosystems' Approach'

As briefly discussed in Chapter II, the ethnosystem approach developed by the Leiden Ethnosystems and Development (LEAD) Programme aims to document and analyse Indigenous Knowledge Systems (IKS) at the community level, contributing to sustainable development in several developing countries (*cf.* Slikkerveer 1990; Agung 2005; Ibui 2007; Leurs 2010; Djen Amar 2010; Ambaretnani 2012; Chirangi 2013; Aiglsperger 2014; Erwina 2019; Saefullah 2019). The Leiden Ethnosystems' Approach, as the principal methodology in the study, provides detailed analyses on the patterns of health care utilisation of people's behaviour by linking the historical process and cultural perspective involved. This approach is designed in an attempt to explain the patterns of health care utilisation behaviour by relating the multidimensionality of different models of behaviour (*cf.* Aiglsperger 2014).

The Leiden Ethnosystems' Approach encompasses three methodological principles, namely the 'Participant's View' (PV), the 'Field of Ethnological Study' (FES), and the 'Historical Dimension' (HD), to gain a better understanding of the knowledge-belief-practice complex of the indigenous system in various settings. The 'Participant's View' (PV) is corresponding to the *emic view*, subjective perspectives on local cosmovision, relationship with nature, and

decision-making systems within a specific culture. In contrast with the *etic view* in which the researcher assesses a culture from its standpoint, the *emic* view provides assessments on aspects of indigenous knowledge from the point of view of the local people (*cf.* Aiglsperger 2014; Saefullah 2019). The concept of PV includes '*the symbolic representations, cosmologies, culture-bound philosophies of nature and environment, perceptions, attitudes, opinions, etc., as part of the underlying structure of values, norms, and belief system which characterise a specific culture'* (*cf.* Slikkerveer 1999: 173).

The second concept, the 'Field of Ethnological Study' (FES), is related to the definition of 'culture area', which refers to the inhabitants in the target area sharing common ancestry (kinship), language, lifestyle, values, symbols, rituals and history, which makes them identify with each other, or possibly even with different ethnic groups within one geographical area which becomes regarded as an entity as a result of that (*cf.* Slikkerveer 1999).

Finally, the 'Historical Dimension' (HD) as the third concept in the ethnosystem approach is constructed on the descriptions delivered through oral transmission by the community members, combined with data from historic recordings, in as far as these are available in a society without a written tradition before the nation-building era. In general, HD places the medical system in the history-geographical context (*cf.* Slikkerveer 1990). In the present study, the HD concept is employed in the historical development of the medical systems in general and Indonesia's National Health care System.

Accordingly, the implementation of the Leiden Ethnosystems' Approach with the three principles of 'Participant's View' (PV), the 'Field of Ethnological Study' (FES), and the 'Historical Dimension' (HD) delivers a rather comprehensive description of the IKS. In the context of health care utilisation behaviour, this approach can also be extended to the concept of medical pluralism in which the traditional, transitional, and modern medical systems co-exist within the community. Comparison of the medical systems in the community provides a better understanding of the determinants of health care utilisation behaviour.

3.1.2 The Multivariate Model of Transcultural Health Care Utilisation

Indonesia, as an archipelago inhabited by great numbers of ethnic groups, is characterised by the plural medical system to suit the varied needs of the people. Therefore, the study of health care utilisation in such settings requires a comprehensive model. Initially, patterns of health care utilisation behaviour have mainly been studied and analysed on the basis of the use of one medical system within the community (*cf.* Friedman *et al.* 1986; Sindiga 1994; Heinrich 1996). The fact that health care delivery systems are changing rapidly, driven by demographic, social, economic, political and technological forces of a complex and interactive nature, affect health care utilisation; the study of this field demands a form of multivariate modelling (*cf.* Oladipo 2014). In the same manner, Slikkerveer (1990) argues that to analyse and explain the complex processes of illness behaviour and health care utilisation in a pluralistic medical configuration requires a multi-dimensional model.

For the recognition of the needs of the multidimensional model to study health care utilisation in a comparative manner, multivariate models have been developed and validated in various forms over time. In 1990, Slikkerveer introduced a multivariate model which provides a means to determine the relationship between numbers of predisposing factors, generating possible determinants in health care utilisation. The factors consist of sets of categories which are: the predisposing factors, enabling factors, perceived morbidity factors, institutional and environmental factors and factors of health care utilisation, and are measured at the individual and system level.

The earlier model of health care utilisation was based on the model developed by Greenlick *et al*. (1968) and followed by Buschkens & Slikkerveer (1982) based on a study carried out in East Africa. Following later developments, the multivariate model was then developed into a

quantitative analytical model focused on the operationalization of the three principals of the Leiden Ethnosystems' Approach (*cf.* Slikkerveer 2003). Over time, this model has been proved to adequately document and analyse people's health care utilisation behaviour in the pluralistic medical configuration.

In view of the general application of the multivariate model and the promising results of the previous studies (*cf.* Slikkerveer 1990; Agung 2005; Ibui 2007; Leurs 2010; Djen Amar 2010; Ambaretnani 2012; Chirangi 2013; Aiglsperger 2014; Erwina 2019; and Saefullah 2019), this model has also been adopted in the present study. As the basis for the analysis of patterns of transcultural health care utilisation behaviour, blocks of independent variables, intervening variables, and dependent variables are conceptualised in the model of the mutual relation analytical model of transcultural health care utilisation (*cf.* Figure 3.1).

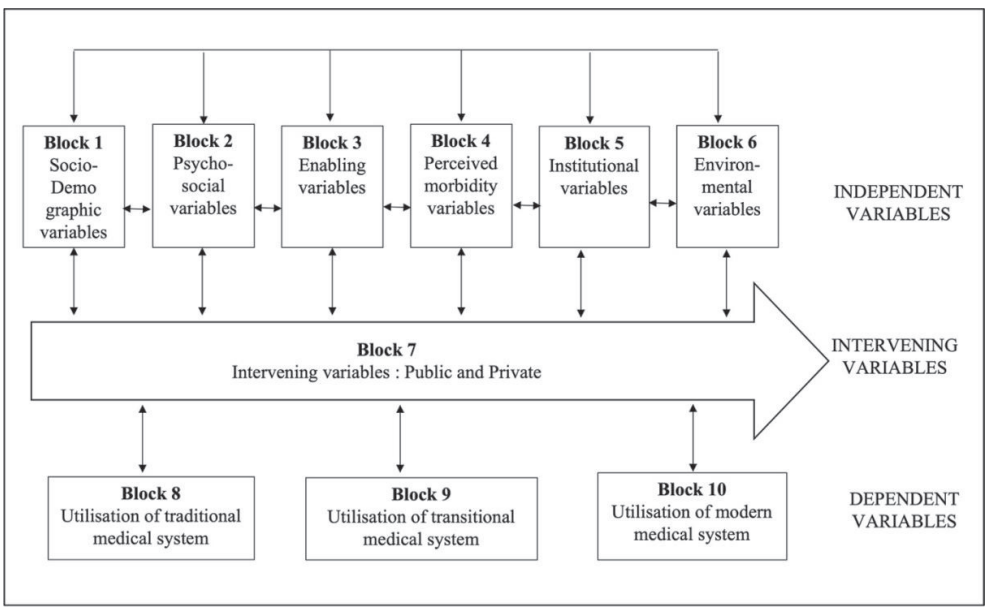

Figure 3.1 Conceptual Model of Transcultural Health Care Utilisation (Adapted from Slikkerveer 1990).

3.1.3 Operationalisation of the Conceptual Model

Prior to operationalisation, the block of factors is specified as concepts. The concepts are assigned on the basis of the literature study of health care utilisation as presented in Chapter II. Furthermore, the blocks of factors are divided into measurable units, namely variable, to operationalise the model into an adequate measurement tool.

Referring to the various studies conducted elsewhere in the field of medical anthropology and the health sector, and following the results of the pilot study, potentially significant variables on health care service utilisation were identified. In the past, several studies have examined the role of predisposing factors, enabling factors, and need factors in the use of health services. A total of fifty-two (52) variables are identified for this study. However, in the future, these 52 variables will be grouped and expanded in a meaningful way to produce smaller or

larger numbers of variables. Any set of variables could be used to construct a determinant which may be operative in a particular situation (*cf.* Oladipo 2014).

Furthermore, the variables which have been identified are then formulated into measurable indicators. Indicators were identified based on the results of a pilot study in Kabupaten Bandung conducted in 2017, thereby applicable to the proposed study related to health care utilisation in the Sunda region. After the indicators and answer categories were set, structured questionnaires were then developed. Questions in the questionnaire were formulated at the individual and community level. Answer categories in the questionnaire were based on the level on which the variables are measured. The composition of block factors, variables, and measurable indicators in this study adopted the structure of block factors, variables, and quantifiable indicators as used by Slikkerveer (1990), Leurs (2010), Ambaretnani (2012), Chirangi (2013), and Aigslsperger (2014) in their studies of transcultural health care utilisation and utilisation of MAC plants.

In the construction of the structured questionnaire, an indicator can ideally be measured with a single phenomenon. However, some indicators, i.e. socio-economic status and accessibility, are somewhat difficult to be measured with only one phenomenon. In this case, several questions were added to make sure the indicators were accurately measured (*cf.* Leurs 2010). The questions in the questionnaire were arranged in the form of closed questions with predefined answers. The predefined answer was then formulated into an answer category prior to the statistical analysis. In addition to the questions regarding the phenomena to identify the indicators, some questions were listed to collect more extensive qualitative information. Tables 3.1-3.7 present the operationalisation of concepts (block of factors) into variables; variables are then formulated into answer categories based on indicators. The answer category listed in the table is a category of the variable used in the statistical analysis.

Independent Variables: Predisposing Factors

Predisposing factors describe the tendency of people to use health services, which can be predicted by individual characteristics which existed before the onset of the disease. Predisposing factors which have been approved in previous studies supported by health services include socio-economic status, the providers of doctors, the policies and beliefs of each nation, and health status (*cf.* Morreale 1998). Oladipo (2014) adds that variables which fall under the predisposing factors are: age, sex, religion, occupation, education, family size, ethnicity, culture, attitude, belief, and health education.

The conceptual model in this study (*cf.* Figure 3.1) employs two types of predisposing factors: socio-demographic and psycho-social factors. Socio-demographic factors included in the present study are household size, household composition, gender, age, level of education, place of birth, ethnicity, religion, marital status, and occupation (*cf.* Table 3.1).

A study in Guatemala found that household size, level of education, and occupation of the household head, in addition to gender, age, and marital status, are associated with health care utilisation (*cf.* Goldman & Heuveline 2000). Generally, income and education level appear to have a positive relationship with the utilisation of a modern medical system (*cf.* Awoyemi *et al*. 2011). In a wider context, Babar *et al*. (2004) conclude that the utilisation of the medical system, either public or private, formal or non-formal, is influenced by socio-demographic factors, level of education, cultural beliefs, and environmental conditions.

For qualitative reasons, the socio-demographic indicators were recorded for every household member to a maximum of ten members in a single household. All of the phenomena related to socio-demographic factors are measured by a single question. In addition to the questions related to sociodemographic background, one qualitative question regarding vaccination history is added to the questionnaire. This question is included in the blocks of socio-demographic factors and intended to be answered by each household member. The vaccination history of

each household member indicates the respondent‘s participation in the preventive health care program, which is part of the Ministry of Health’s policy.

Table 3.1. Block 1 Independent Predisposing Factors: Socio-Demographic Factors

Concept	Variable	Indicator	Category
Socio-demographic	Household size	Number of household members	1 member; 2 members; 3 members; 4 members; 5 members; 6 members; 7 members; 8 members; 9 members; > 10 members
	Household composition	Relationship of household head to household members	Household head; spouse; parent; child; sibling; brother/sister in-law; parent in-law; child in-law; grandparent; grandchild; niece; cousin; non-kin
	Gender	Gender classification	Male; female
	Age	Number of years alive	0-5; 6-10; 11-15; 16-20; 21-25; 26-30; 31-35; 36-40; 41-45; 46-50; 51-55; 56-60; 61-65; 66-70; 71-75; 76-80; 81-85; >86
	Education	Level of education completed	No education; basic education; intermediate education; higher education; other
	Place of birth	Location of the place of birth	In this village; in another village; other
	Ethnic	Ethnic origin	Sundanese; Javanese; Madura; Minangkabau; other
	Religion	Religious affiliation	None; islam; catholic; protestant; buddhism; hinduism; confusianism; other
	Marital status	Present marital status	Single; married; divorced; widow; other
	Occupation	Current occupation	Farmer; construction worker; retailer; labour; private employee; civil servant; teacher; maid; entrepreneur; unemployed; other

Source: Household Survey 2017

The second block in the predisposing factors is the psycho-social factors, which refers to the knowledge, ideas, opinions, beliefs and attitudes of the members of the community. As listed in Table 3.2, this block includes the knowledge, belief, and opinion variables which are directly linked with the three dependent variables. In addition to these twelve variables, a variable of knowledge on diabetes mellitus is also added. This variable is included in the analysis of transcultural health care utilisation because it is reported that knowledge of the disease might affect the utilisation of health care services (*cf.* Siddique *et al.* 2017).

Table 3.2. Independent Predisposing Factors: Psycho-Social Factors

Concept	Variable	Indicator	Category
Psycho-social Factors at the Individual level	Knowledge of traditional medicine	Level of knowledge of the traditional medicine	Do not know; none; very little knowledge; little knowledge; average; much knowledge; very much knowledge
	Knowledge of transitional medicine	Level of knowledge of the transitional medicine	Do not know; none; very little knowledge; little knowledge; average; much knowledge; very much knowledge
	Knowledge of modern medicine	Level of knowledge of the modern medicine	Do not know; none; very little knowledge; little knowledge; average; much knowledge; very much knowledge
	Belief in traditional medicine	Level of belief in the traditional medicine	Do not know; none; very little belief; little belief; average; much belief; very much belief
	Belief in the transitional medicine	Level of belief in the transitional medicine	Do not know; none; very little belief; little belief; average; much belief; very much belief
	Belief in modern medicine	Level of belief in the modern medicine	Do not know; none; very little belief; little belief; average; much belief; very much belief
	Opinion on traditional medicine	Level of opinion in the traditional medicine	Do not know; no opinion; very negative opinion; negative opinion; neutral; positive opinion; very positive opinion

Table 3.2. (*continued*)

Concept	Variable	Indicator	Category
	Opinion on transitional medicine	Level of opinion on the transitional medicine	Do not know; no opinion; very negative opinion; negative opinion; neutral; positive opinion; very positive opinion
	Opinion on modern medicine	Level of opinion on the modern medicine	Do not know; no opinion; very negative opinion; negative opinion; neutral; positive opinion; very positive opinion
	Knowledge of diabetes mellitus	Level of knowledge of the transitional medicine	Do not know; none; very little knowledge; little knowledge; average; much knowledge; very much knowledge

Source: Household Survey 2017

Indicators of knowledge on medical systems cannot be measured with only single phenomena. Each variable was operationalised into several phenomena which are measured individually. In this case, respondents were asked to demonstrate their knowledge of the medical system by mentioning the name and use of medicinal plants, over-the-counter (OTC) medicine, and prescription medications including their application. The belief and opinion variables were measured by asking for the respondent's perceived effectiveness and opinion on the medical system.

The questions in Block 2 which are related to the knowledge and source of knowledge of the medical system and diabetes mellitus generate a dataset of qualitative information to be presented in Chapter V. Data based on the real answers are processed and generate datasets with knowledge, belief, and opinion levels on medical systems with a ranked scale from 'very little' to 'very much'. The categories of the variables are used for further bivariate and multivariate analysis in Chapter VIII.

The enabling factors

The enabling factors relate to the ability of the people and availability of the means to utilise health services. Enabling factors can be measured by family resources such as socio-economic status (SES), health insurance, family income, costs, free health care, and health insurance (*cf.* Alidapo 2014). SES is believed to be a significant factor in influencing utilisation behaviour. Several studies document the effect of SES on access or choice to health services. One study showed that community-dwelling elders reported a delay in prescription use because of low income (*cf.* Klein *et al*. 2004). In addition, low income was also found to be associated with increased hospitalisation among people with diabetes mellitus (*cf.* Booth & Hux 2003).

While income is considered a coherent measure of economic status, indicators to measure the economic status of those living in an agricultural society such as Indonesia's are still unclear. People living in an agricultural society are often unable to ascertain precisely how much they earn and spend on a monthly or yearly basis. In view of this fact, economic status is measured on the basis of the presence or absence of a variety of household consumption items. The variables that indicate economic status are home materials and size; home appliances; home facilities; and ownership of transportation means. The related phenomena are measured to

assess the intended category as 'very poor', 'poor', 'average', 'rich', or 'very rich'. Self-assessment of SES by respondents is also included in the questionnaire as a control variable.

In addition to socio-economic status, health insurance is also an important determinant of use of health services (*cf.* Ayanian *et al.* 2000). In a comprehensive review on the effects of public health insurance on utilisation of health care services, it is revealed that participation in public health insurance has a positive impact on the utilisation of curative and preventive care (*cf.* Erlangga *et al*. 2019).

As qualitative variables, the variables of monthly income and monthly expenses for health care were added to the questionnaire. Those variables give an insight into the proportion of expenditure for health care from the total income of the family and allow the assessment of the difference in expenditures on the health service between insured and uninsured respondents.

Table 3.3 presents variables in the block of enabling factors, namely: socio-economic status, monthly income, monthly expenses for health care use, and participation in the health insurance.

Table 3.3. Independent Enabling Factors

Concept	Variable	Indicator	Category
Enabling factors at the individual level	Monthly income	Average amount of household head monthly income (in Rupiah)	Do not know; none; 1-3.000.000; 3.000.001-6.000.000; 6.000.001-9.000.000; 9.000.001-12.000.000; >12.000.001
	Monthly expense for health care	Average amount of expenses for monthly health care (in Rupiah)	Do not know; none; 1-1.000.000; 1.000.001-2.000.000; 2.000.001-3.000.000; 3.000.001-4.000.000; >4.000.001
	Socio-Economic Status (SES)	Level of SES	Do not know; very poor; poor; average; rich; very rich
	Insurance	Participation in a health insurance company	No insurance; private insurance; BPJS; others

Source: Household Survey 2017

Perceived morbidity factors

Perception is defined as 'people's capacity to perceive the world by means of one's senses' (*cf.* Fish 2010). When individuals perceive they are experiencing an illness, they tend to take action which is known as a health-seeking process. In the present study, perceived morbidity was operationalised by the reported health status and diseases experienced by the respondent in the past twelve months. Health status is the most important factor associated with increased health care utilisation. The health status of an individual determines the need for care. There is consistent evidence that shows that the lower health status of a population directly results in increased health care utilisation of all types. Even though this study focuses on diabetes mellitus, diseases other than diabetes mellitus are also recorded for each household member for further analysis in health care utilisation behaviour. Ten diseases were listed in the questionnaire based on the highest prevalence in Indonesia from the categories of non-communicable and communicable diseases. Twelve months of retrospective orientation were chosen because most studies conduct retrospective analyses to establish the behaviour of people who have already sought and received medical help (*cf.* Ambaretnani 2012).

In cases where respondents repored an episode of illness in the past twelve months, they were asked further regarding their reported disease, including perceived symptoms, duration, and disease complications. Variable symptoms and causes of the disease are added as control variables concerning knowledge of the disease. Variable symptoms of the disease are measured using multiple responses. In this case, respondents were asked to identify the general symptoms of the disease as psychological or physical disturbance and they were allowed to give more than one response. Likewise, variable causes of the disease are also given as a question with multiple responses: respondents were asked to identify the cause of the reported disease as a lifestyle-related disease, disease caused by virus or bacteria, or a spiritual cause such as a curse.

Table 3.4 presents the variables on perceived morbidity factors: health status, disease in the past twelve months, duration of the reported disease, symptoms of the disease, and cause of the disease.

Table 3.4 Independent Perceived Morbidity Factors

Concept	Variable	Indicator	Category
Perceived Morbidity factors at the individual level	Health status	Perceived overall physical health	Very poor; poor; average; good; very good
	Reported illness	Disease experienced in the past 12 months	Diabetes mellitus; hypertension; CVD; gout; Rheumatioid; Tuberculosis; bronchitis; typhus; dysentry; influenza; others
	Duration of the reported illness	Duration of illness	<1 week; 2-5 weeks; 6-9 weeks; 10-13 weeks; 14-17 weeks >17 weeks
	Symptoms	Main symptoms of the disease	General symptoms of diabetes mellitus and other diseases
	Complication of the disease	Name of the disease other than main disease	No complications; cardiovascular disease; metabolic disorder; renal disorder; eye disease; gangrene; gastrointestinal disorder; liver disease; bacterial infection

Source: Household Survey 2017

Institutional Factors

The institutional factors comprised the financial and geographical accessibility of local and central health care facilities and services. This variable is measured with two phenomena related to the distance to access the facility of the particular medical system and the cost to obtain the medical service. Dimensions of distance to health care facilities, namely travel time, waiting time, and means of transport, could significantly influence health care utilisation (*cf.* Mattson 2010; Amangbey 2014). A study conducted by Winters *et al*. (2006) reveals that travel distance and related costs affected the patient's decision on the utilisation of health care services. Participants were asked whether there is a specific health care service as well as traditional healers within a radius of 8 km, and if so, whether the service is considered to be affordable. Awoyemi (2011) identified that in the rural area, where the average distance to modern health facilities is 8.33±4.51 km, distance has a negative influence on the utilisation of modern health care facilities. The same study also reveals that long distance, long travel time, and the high cost of transportation are factors which influence the low utilisation of the modern health service in the rural area. The specific variables and indicators are presented in Table 3.5.

Table 3.5. Independent Institutional Factors

Concept	Variable	Indicator	Category
Institutional factors at the system level	Accessibility of the traditional medical system	Distance to access the traditional medical system	No facility reported; 0.1 – 2.0 Km; 2.1 – 4.0 Km; 4.1 – 6.0 Km; 6.1 – 8.0 Km; > 8.1 Km
		Cost to access/ obtain service from the traditional medical system (in Rupiah)	Free; 1 – 10.000; 10.001 – 20.000; 20.001 – 30.000; 30.001 – 40.000; > 40.001
	Accessibility of the transitional medical system	Distance to access the transitional medical system	No facility reported; 0.1 – 2.0 Km; 2.1 – 4.0 Km; 4.1 – 6.0 Km; 6.1 – 8.0 Km; > 8.1 Km
		Cost to access/ obtain service from the transitional medical system (in Rupiah)	Free; 1 – 10.000; 10.001 – 20.000; 20.001 – 30.000; 30.001 – 40.000; > 40.001
	Accessibility of the modern medical system	Distance to access the transitional medical system	No facility reported; 0.1 – 2.0 Km; 2.1 – 4.0 Km; 4.1 – 6.0 Km; 6.1 – 8.0 Km; > 8.1 Km

Table 3.5. (*continued*).

Concept	Variable	Indicator	Category
		Cost to access/ obtain service from the transitional medical system (in Rupiah)	Free; 1 – 10.000; 10.001 – 20.000; 20.001 – 30.000; 30.001 - 40.000; > 40.001
	Nearest medical facility	Nearest health care facility from the respondent's house	No health care facility reported; traditional healer; pharmacy; private clinic; primary health care facility; hospital
	Farthest medical facility	Farthest health care facility from the respondent's house	No health care facility reported; traditional healer; pharmacy; private clinic; primary health care facility; hospital

Source: Household Survey 2017

Environmental factors

Environmental factors describe the environmental characteristics where a respondent lives which may influence the utilisation of the medical system. These factors are complicated in a large developing country. Access to health services is becoming increasingly unequal, particularly in rural areas. Three spatial variables were included in this study. The first variable is urban or rural residence. Several studies have found that people living in highly urbanised areas had more opportunities to access various conventional and non-conventional therapies. Therefore, it is reasonable to make conclusions for the urban and rural category in this study. In addition, residential status and geographical characteristics are also included in this study. Details of the variables in the environmental factors are presented in Table 3.6.

Table 3.6. Independent Environmental Factors

Concept	Variable	Indicator	Category
Environmental factors at the individual level	Residential environment	Residential typology based on population density	Rural area; suburban area; urban area
	Residential status	Residential status of the household head	Native resident; migrant; temporary inhabitant
	Land	Geographical characteristic of the location where the respondent is living	Mountainous land; plain land; low land

Source: Household Survey 2017

Intervening factors

Intervening factors refer to the external factors which are considered as altering the standard patterns of behaviour. In the present study, the intervening factors are operationalised into several questions regarding knowledge of the respondent and their perceived impact on the public policies, public promotions, and private policies as well as the private promotions of the three medical systems. Following the implementation of National Health care Coverage in 2014, public and private health insurance are also listed as intervening factors. To measure this variable, respondents were asked to indicate their perception of this impact using the ranked scale from 0 'no impact' to 5 'very much impact', to avoid miscalculations when recoding the original answers. Table 3.7 presents the chosen variables for the intervening factors.

Table 3.7. Intervening Factors

Concept	Variable	Indicator	Category
Intervening factors at the system level	Impact of policy on traditional medical system	Level of impact of the policy on health-care utilisation	None; very little impact; little impact; average; much impact; very much impact
	Impact of policy on transitional medical system	Level of impact of the policy on health-care utilisation	None; very little impact; little impact; average; much impact; very much impact
	Impact of policy on modern medical system	Level of impact of the policy on health-care utilisation	None; very little impact; little impact; average; much impact; very much impact
	Impact of public health insurance	Level of impact of the policy on health-care utilisation	None; very little impact; little impact; average; much impact; very much impact
	Impact of promotion on traditional medical system	Level of impact of the policy on health-care utilisation	None; very little impact; little impact; average; much impact; very much impact
	Impact of promotion on transitional medical system	Level of impact of the policy on health-care utilisation	None; very little impact; little impact; average much impact; very much impact
	Impact of promotion on modern medical system	Level of impact of the policy on health-care utilisation	None; very little impact; little impact; average; much impact; very much impact

Table 3.7. (*continued*).

Concept	Variable	Indicator	Category
	Impact of private insurance	Level of impact of the policy on health-care utilisation	None; very little impact; health little impact; average; much impact; very much impact

Source: Household Survey 2017

Dependent Variables

As the purpose of this study was to examine patterns and predictors of use *across* health care systems (rather than strictly *within* one health care system), it is necessary to conceptualise these three health care systems as distinctive rather than joint components of one overall system, serving to reveal dimensions of medical pluralism and the extent to which medical dominance is (or is not) pivotal in this 'new medical pluralism'.

In the analysis, the dependent variables were divided into three utilisation variables: the traditional, transitional, and modern medical system. Utilisation rates of the health services were calculated by the experience of using at least one of the medical systems in the past year. Table 3.8 explains the dependent variables used in this study.

Table 3.8. Dependent Health care Utilisation Factors

Concept	Variable	Indicator	Category
Health care utilisation factor at the system level	Utilisation of the traditional medical system	Contacts of the individuals with the traditional medical system	Utilisation rates of the traditional medical system
	Utilisation of the transitional medical system	Contacts of the individuals with the transitional medical system	Utilisation rates of the transitional medical system
	Utilisation of the modern medical system	Contacts of the individuals with the modern medical system	Utilisation rates of the modern medical system

Source: Household Survey 2017

3.2 Selection of the Research Area, Sample, and Development of Household Surveys

3.2.1 Selection of the Research Area

In the preparation phase, a literature study was conducted for the description of the geographical and administrative data of the research area, covering the geographical entity known as the *Tatar Sunda* Region. The *Tatar Sunda* or *Parahyangan* region refers to the cultural area of the province of West Java and Banten. The present study was conducted in Kabupaten Bandung, the western part of Tatar Sunda in Java Island. Kabupaten Bandung has been endowed with a rich plant diversity base because of its heterogenous ecologies, fertile land conditions, and cool and humid climate. Most people in Kabupaten Bandung, especially in the rural area, rely on traditional medicine or traditional healers for the treatment of common illnesses. In general, the

characteristics of Kabupaten Bandung, in the context of bio-cultural diversity, provide a valuable resource for the study of people's behaviour and their interaction with the natural environment.

In addition to the geographical features, the selection of the research area has also considered the environmental characteristics such as rural/urban communities and local availability of health care services and facilities. Consequently, this study employs multistage cluster sampling, including stratification at each stage of the design, to refine the selected sample. The procedure involved stratifying the sub-districts into rural and urban areas. From each stratification, clusters were drawn on the basis of the availability of the primary health care facility, drug vendors/retailers, and traditional healers. Then, each cluster was further stratified by the distance to the health care facilities.

Kabupaten Bandung is divided into 31 sub-districts. Among these 31 sub-districts, three sub-districts were selected representing: farthest and closest area from the district hospital, highland and lowland area, and urban and rural environments. The selected sub-districts are presented in Table 3.9.

Table 3.9. Characteristics of the Selected Research Area

Sub-district	Geographic Characteristic	Environmental Characteristic	Distance to district hospital
Pangalengan	Highland	Rural	31 km
Cilengkrang	Highland – Land	Semi-urban	29 km
Katapang	Central Lowland	Urban	6 km

Source: Household Survey 2017

The local community in Indonesian development refers to the administrative structure from the district level (*Kabupaten/Kota*) to the lowest level (*Rukun Tetangga* or RT). RT is a sub-group of households in the groups (*Rukun Warga* or RW), of a sub-village (*dusun*, *kampung*) or a village (*desa, kelurahan*). The RT is the lowest democratic system in the community in Indonesia. Figure 3.2 shows the administrative structure of the selected research area.

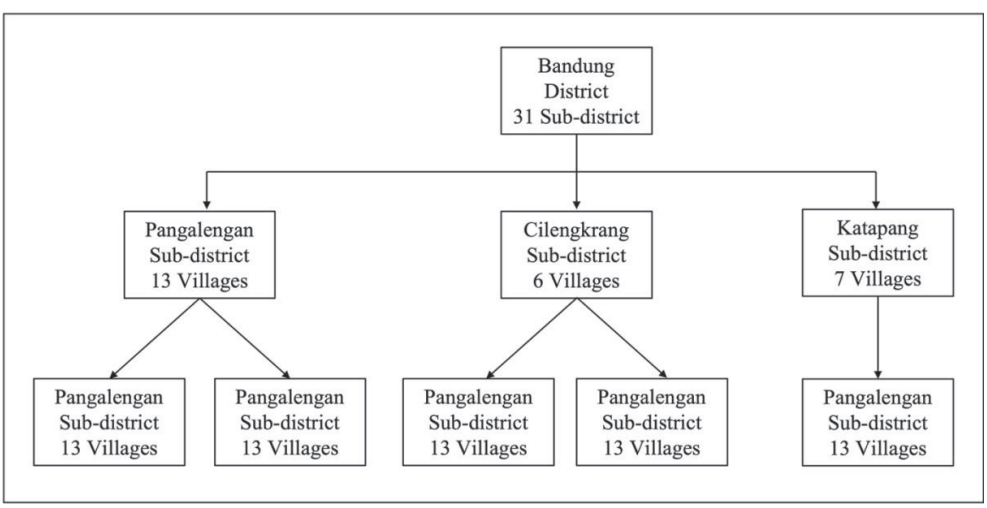

Figure 3.2 Administrative Structure of the Selected Research Area

The villages were selected based on the type of environment and characteristics of the community. The type of environment plays an important role in the utilisation of MAC plants by the communities. By applying this specification, a properly selected representative sample should be drawn from the population by taking into consideration that each member of the population has an equal statistical chance of being chosen as a representative of the population. The following quantitative surveys were carried out in five pre-selected villages from three sub-districts, namely Lamajang and Sukaluyu, representing the rural environment; Cipanjalu and Ciporeat representing the semi-rural environment; and Katapang representing the urban environment (*cf.* Table 3.10).

Table 3.10. List of Villages Selected for the Household Survey

Village	Subdistricts	Number of Households	Number of Household Members
Lamajang	Pangalengan	46	210
Sukaluyu	Pangalengan	35	147
Cipanjalu	Cilengkrang	41	150
Ciporeat	Cilengkrang	27	91
Katapang	Katapang	60	235
Total		209	833

Source: Household Survey 2017

3.2.2 Selection of the Samples

This study has been approved by the Ethical Committee Universitas Padjadjaran and Badan Kesatuan Bangsa dan Politik, Kabupaten Bandung, West Java, Indonesia (*cf.* Appendix 1). After the approval was obtained, the strategies of sampling the target population were then determined. Since this study targets information at the individuals' level, the sampling method implements a combination of non-probability and probability sampling techniques.

Non-probability sampling provides a sound basis for exploratory research and collecting cultural data, as this information is mostly provided by experts in the community. For the collection of the qualitative data, this study employed a non-probability sampling technique in the form of convenience sampling, in which respondents are selected based on their ease of access: snowball sampling, in which the next informant is based on referral from another informant. Naderifar *et al.* (2017) conclude that snowball sampling can be effectively used to access a specific group of people; in view of the present study, this is the person with knowledge of *ubar kampung*.

For the quantitative study, participants were purposely selected from households with at least one member suffering from diabetes. Households become the center of this study because decisions about living arrangements, health, education, and migration are made at the household level (*cf.* UN 2017). In the present study, a household is operationalised as a group of persons residing in the same house who make common provisions for primary living needs (*cf.* UN 2017). Despite the fact that it is easier to select diabetes mellitus patients from patient records at the local health care facilities, the participants in the present study were selected through word-of-mouth advertising to community elders, community *kader*, and persons with type 2 diabetes mellitus. This approach is employed to avoid data bias, as patient's records in the formal health care facilities only list the patients who obtain medical services from modern health care providers. Consequently, information on patients who use only traditional or transitional medicine cannot be documented.

In this study, there are 209 households with at least one member with diabetes mellitus that will be interviewed. Diagnosis of diabetes mellitus was based on self-reporting, and some participants provided the interviewer with health records from the clinics. The sample size in

some villages may not provide sufficient data to detect all the determinant factors in the utilisation because of the limited number of diabetes mellitus patients. Even so, there is a consistency in the results across the set of indicators as presented in the statistical analysis results presented in Chapter VIII.

3.2.3 Development of the Household Surveys

The questionnaire was adapted from the questionnaire developed by Slikkerveer (1995). The questionnaire was designed with the following structure: The first section comprises general information to assess the socio-economic status of the household. The second section consists of questions regarding six blocks of independent variables. Each question is given a remark, whether it is a question with a single answer or multiple answers. In many cases, it is not feasible to include every possible answer category; in this case, an 'other' category is provided with space for the respondent to fill in a more specific response. The third section consists of questions regarding the intervening variables. In general, this section records the knowledge and perceived impact of policies and promotions both from the government and private bodies on the utilisation of the traditional, transitional, and modern medical system.

The questions regarding the utilisation of the medical system are presented in the final section and answered by the patients. The questions consist of the location, means, cost, and results of the related health service used. The instrument was drafted in English and then independently translated into the Indonesian language. Before conducting a large-scale household survey, the validity of the instrument was ascertained by checking the accuracy and completeness of the responses in the pilot study.

3.3 Data Collection

The data collection is focused on the knowledge-belief-practice complex of *ubar kampung* and the utilisation of three medical systems in the research area. Participants' observations and interviews have been employed throughout the fieldwork. Interview techniques used in the present study are structured, semi-structured, and unstructured interviews. During the fieldwork, two strands of data were gathered: firstly, quantitative data from the household survey for further analysis of the multivariate model of transcultural health care utilisation; and secondly, qualitative data from an in-depth interview with key informants. Bernard (2002) states that '*ethnography and survey data combined produce more insight than either one alone*'. Simultaneous qualitative and quantitative data collection enables continuous cross-checking of facts and interpretations (*cf.* Sharp 2005).

3.3.1 Quantitative Study

The extensive survey has been undertaken to collect data on people's health care utilisation behaviour. The quantitative household survey serves as appropriate means to collect data on demographic, psychosocial, socio-economic, and perceived morbidity (*cf.* Aiglsperger 2014).

Recruitment, training, and supervision of the interviewers took place on the first week of September 2017 at the Faculty of Pharmacy Universitas Padjadjaran. The interviewers were, for the most part, undergraduate students at the Faculty of Pharmacy Universitas Padjadjaran, and all of them participated in one-week training programs at the respective faculty. The interviewers were given clear instructions for completing the questionnaire, including examples of how to use any unusual response scales. During the survey, the interviewer instructed the respondents on each question without influencing the answer. Although the questionnaire was written in Bahasa Indonesia, interviews were conducted in both Bahasa Indonesia and the local

language (Sundanese). Responses were written down in Indonesian for ease of checking and coding; all interviewers were fluent in both the local language and Indonesian.

The interviews were conducted from nine o'clock in the morning to nine o'clock in the evening (except mealtimes) when the respondents were available. Before the interview, the interviewer introduced herself and tried to engage in small talk to make respondents feel more comfortable. After a brief conversation, the interviewer asked the respondents if they could spend about an hour to answer the questions. Interviewers were particularly encouraged to include women/spouses and younger adults in the discussions. As Sharp (2005) argues, the household head who is considered to know more about the land and socio-economic conditions may not know the activities of other members of the household. Moreover, the group interview allows discussion among household members to give responses to the more complex questions. At the end of the interview, the interviewer checked the completed questionnaire to make sure all of the data were recorded correctly. Most of the completed questionnaires were checked and edited in the field, so that return visits to some respondents could be made in cases where errors had been detected.

3.3.2 Qualitative Study

Although the major endeavour of this study is the execution of the quantitative data collection through a household survey, this phase of the research also provided important information for the overall presentation of the research area. As briefly discussed in the previous section, for the collection of qualitative data, the present study employed participant observation and interviewing techniques. As defined by Schensul *et al*. (1999), '… *participant observation is the process of learning through exposure to or involvement in the day-to-day or routine activities of participants in the research setting'*. Participant observation has been included in several qualitative studies as a way to collect information which enables the researcher to observe the cultural members in their daily lives and to participate in their activities, in order to facilitate a better understanding of those behaviours and activities (*cf.* Kawulich 2005). The goal of using participant observation as a method is to develop a holistic understanding of the phenomena under study and to present the result as objectively and accurately as possible (*cf.* De Walt & De Walt 2002).

However, Kawulich (2005) also listed several limitations of participant observation which can also be a source of erroneous description in behavioural research. One of the limitations is researcher bias, because the data collected is based on the researcher's individual interest in a particular setting or behaviour. To alleviate this limitation, De Walt & De Walt (2002) suggest that the researcher has to *study what is happening and why, sort out the regular from irregular activities; look for variation to view the event in its entirety from a variety of viewpoints; look for the negative cases or exceptions; and, when behaviours exemplify the theoretical purposes for the observation, seek similar opportunities for observation and plan systematic observations of those events/behaviours*.

Furthermore, the researcher conducted in-depth interviews which included key informants from the community. The two main different interview techniques used in this study were the semi-structured and the unstructured interview. The main interview technique applied throughout all the fieldwork was the semi-structured interview. The advantage of semi-structured interviews is that they leave room for the respondents to give additional information since the questions in a semi-structured interview are based on open-ended questions (*cf.* Leurs 2010).

Key informants were selected for these in-depth semi-structured interviews throughout the months of fieldwork in September-December 2017. These key informants are the local specialists and the representatives of the local authorities, and included many local (*adat*) leaders, representatives of *kader*, traditional healers, and local plant experts. Interviews were

conducted in Sundanese and Bahasa Indonesia. Every key informant was interviewed once. The participant observations and interviews were focused on the subjects: knowledge, beliefs, and practices of *ubar kampung*; local knowledge on diabetes mellitus; and indigenous classification of MAC plants. The informants were also requested to show the medicinal plants. The reported medicinal plants were then collected and photographed. The collected plants were identified with the help of a botanist.

3.4 Data Analysis

The two strands of field data were, to some extent, analysed separately, using the methods typical of each approach. The household survey was presented in the form of a statistical profile of transcultural health care utilisation, while qualitative data regarding the geographical description and natural environment of the villages were presented in the narrative form. Nevertheless, some of the statistical analyses of the results and qualitative findings are combined in various ways during the report writing.

Before conducting the statistical analysis, the collected data was sorted, following several steps including data cleaning which refers to the process of detecting and removing missing records, data sorting in the form of a matrix, and data ordering in the form of tables and graphs. Subsequently, statistical methods were chosen in accordance with the objective to evaluate the relationship and interactions between and among variables within the block as well as the relationship between the blocks. Basically, any statistical analysis is essential for adequate progress and outcomes of the research because it facilitates not only reaching valid insights for complicated problems but also formulating sound recommendations for realistic policy planning and implementation (*cf.* Slikkerveer *et al.* 2019).

Datasets were created for the analysis of the results of the household survey. The first dataset was based on the number of members of the household participating in the survey, which is 833 household members. The second dataset consists of health care utilisation rates of household members identified as patients (N=360). The identification of utilisation rates of the patients is explained in Paragraph 6.2 where Table 6.6 illustrates 360 household members categorised as 2 non-action patients and 358 action patients who account for a total of 611 utilisation rates.

The data was analysed at three levels: the univariate, bivariate and multivariate level. At the univariate level of analysis, descriptive statistics were used to present the socio-economic and demographic characteristics of respondents. Dataset 1 (N=833) is subject to univariate analysis as descriptive analysis to substantiate the qualitative findings described further in Chapters IV and V. Dataset 2 (N= 611) provides the basis for stepwise analysis consisting of four stages, including bivariate, mutual relation, multivariate and multiple regression analysis. Those analyses were applied to the dataset using the IBM Statistical Package for Social Sciences (SPSS) Version 25.

In the present study, bivariate analysis shows to what extent the dependent variable can be predicted from the independent and intervening variables from the model. The cross-tabulation technique is used for the bivariate analysis in order to demonstrate the relationship between two variables which have been organised in the table. This technique is designed to detect and describe the relationship between two nominal or ordinal variables. In the cross-tabulation table, the independent and intervening variables are designated as row variables; consequently, dependent variables become the column variables. This configuration results in a sum 100% across dependent variables, hence the interpretation is based on comparing down each category.

Since the difference was observed, Pearson's chi-square ($\chi 2$) test is used to identify a significant relationship between two variables. Pearson's chi-square test is used to evaluate whether the two variables within cross-tabulation are associated and whether the association occurs by chance or reflects actual phenomena in the population (*cf.* Leurs 2010; Aiglsperger 2014). The chi-squared test needs an adequately large sample size because it is based on an

approximation approach. The result is relevant only when no more than 20% of cells with expected frequencies < 5 and no cells have an expected frequency of < 1 (*cf.* Bewick 2004)

In addition to the chi-square statistic obtained from the table, it is common to report the exact significance level. By using these values, the nature of the relationship can be determined. Nevertheless, a number of studies have refined the mere dichotomy of defining values above .05 as 'non-significant' and values below .05 as 'significant' into a more nuanced classification of significance. In general, p-values above the threshold of .05 may indicate a certain trend among data, while values below the criterion may differ in terms of being significant. Pearson's chi-squared test (v2), however, does not only establish if the associations show significance but is also able to measure the degree of significance (*cf.* Agung 2005; Leurs 2010; Djen Amar 2010). The significance values of Pearson's chi-square test are arranged along the following scale: $\chi 2>.15$ 'non-significant'; $\chi 2=.15\text{-}.10$ 'indication of significance'; $\chi 2=.10\text{-}.05$ 'weakly significant'; $\chi 2=.05\text{-}.01$'strongly significant'; $\chi 2=.01\text{-}.001$ 'very strongly significant'; and $\chi 2<.001$ 'most strongly significant' (*cf.* Agung 2005; Leurs 2010; Djen Amar 2010; Ambaretnani 2012; Chirangi 2013; Aiglsperger 2014; Erwina 2019; Saefullah 2019; De Bekker 2020).

Although the associations between two variables are already found, the value doesn't provide information about the strength of the association. Calculated chi-square is directly proportional to the sample size which means that a relatively strong association between the variables may not be significant when the sample size is small; conversely, a large sample may result in a statistically significant relationship even when the association between variables is very weak. It is necessary to know the strength of the association as well as the significance between variables. There are three different measures of effect size for the chi-square test: Phi (φ), Cramer's V (V), and the odds ratio (OR). Among them φ and OR can be used as the effect size only in 2×2 contingency tables, but not for bigger tables (*cf.* Bewick 2004). In this case, Cramer's V is used to measure the association. Cramer's V is based on the value of the chi-square which ranges between 0 and 1, with 0 indicating no association and 1 indicating perfect association (*cf.* Field 2009).

Following the interpretation of the significant/non-significant associations in the bivariate analysis, all of the significant variables are clustered into each related block in the analytical model. The model, a mutual relation, presents the first insight into the role of each variable as the determinant. In addition, the mutual relation analysis provides an advantage to pave the way for the final step in the multiple regression analysis. The results from the mutual relation analysis can be interpreted as the first level of identification of determinants in transcultural health care utilisation (*cf.* Slikkerveer & Lionis 2011).

The third step in the stepwise analytical process in the transcultural health care utilisation includes the execution of a multivariate analysis. The multivariate analysis provides a multidimensional conceptualization of health care utilisation as this approach not only allows the measurement of the relationship between variables, but also mutual interactions among all variables in the model (*cf.* Slikkerveer *et al.* 2019). In this case, the Department of Methodology and Statistics of the Faculty of Psychology of Leiden University have developed the appropriate analytical program for multivariate statistical analysis, namely OVERALS.

Characteristic features of OVERALS are the partitioning of the variables into K sets and the ability to specify any of a number of measurement levels for each variable separately (*cf.* De Leeuw 1984). Analogous to the situation in multiple regression and canonical correlation analysis, OVERALS focuses on the relationships between sets; any particular variable contributes to the results only in as much as it provides information which is independent of the other variables in the same set. The advantage of this type of analysis over classical multivariate analysis is that it can handle categorical data which do not have *a priori*

quantifications to be treated numerically. Therefore, its transformation graphs need not be straight, hence nonlinear multivariate analysis *(cf.* Van de Geer 1993).

The fourth step in the stepwise analytical process is multiple regression analysis with the objective to predict the value of dependent variables on the basis of the value of two or more independent or intervening variables. In order to determine the relative importance of the blocks of independent and intervening variables with the blocks of dependent variables, OVERALS analysis is able to measure the association which is expressed as the 'eigenvalue'.

3.5 Ethnobotanical Survey

The ethnobotanical survey documents knowledge of *ubar kampung* and collects the name of the MAC plants used by the key informants for the treatment of diabetes mellitus. The data was mainly collected on a semi-structured interview with selected knowledgeable elders in the Sunda region. The key informants were selected with the help of local inhabitants using snowball sampling. The interview was conducted in the Sundanese language. During the interview, the information regarding the collection, preparation, and use of each medicinal plant was recorded. Since this study highlights the *emic* point, informants were requested to make a free listing of the plants by their common or local name. In addition to the plants mentioned by the key informants, this study also used structured questions with the list of MAC plants to appraise the community knowledge and personal use of the most common MAC plants (TOGA).

Each plant growing *in situ* in the research area was photographed (some of them were collected and dried) and further identified by a botanist from the Biology Department, Faculty of Mathematics and Science, Universitas Padjadjaran. The local names of the plants were then crosschecked with a literature search for their scientific names. Furthermore, on the basis of this literature research, each MAC plant was complemented by its pharmacological activities. The results and findings of this particular ethnobotanical survey technique will be presented in Chapter VI.