



Universiteit
Leiden
The Netherlands

Gintingan in Subang : an indigenous institution for sustainable community-based development in the Sunda Region of West Java, Indonesia

Saefullah, K.

Citation

Saefullah, K. (2019, April 30). *Gintingan in Subang : an indigenous institution for sustainable community-based development in the Sunda Region of West Java, Indonesia*. Leiden *Ethnosystems and Development Programme Studies*. Retrieved from <https://hdl.handle.net/1887/72202>

Version: Not Applicable (or Unknown)

License: [Leiden University Non-exclusive license](#)

Downloaded from: <https://hdl.handle.net/1887/72202>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/72202> holds various files of this Leiden University dissertation.

Author: Saefullah, K.

Title: Gintingan in Subang : an indigenous institution for sustainable community-based development in the Sunda Region of West Java, Indonesia

Issue Date: 2019-04-30

Chapter III RESEARCH METHODS AND ANALYTICAL MODEL

This chapter introduces the research methods used to investigate people's utilisation behaviour towards socio-economic institutions. This research follows the academic tradition of the 'Leiden Ethnosystems Approach' to study people's behaviour, and this chapter describes the approach that allows a detailed study of the anthropological and geohistorical concepts of the 'Participant's View' (PV), the 'Field of Ethnological Study' (FES), and the 'Historical Dimension' (HD) which is introduced by Slikkerveer (1990; 1999). The present study adopts the so-called multivariate model of utilisation behaviour, which has been adapted from previous research conducted on applied ethnoscience and development, particularly on the patterns of behaviour in different sectors of the society and across a variety of geographical areas. By developing the research orientation, a combination of qualitative and quantitative research methods will be used through a 'sequential transformative approach' as both qualitative and quantitative approaches have the same quality in terms of its importance in explaining the study (Creswell 2014). The qualitative research involves participative and non-participative observations, interviews with the people, literature research as well as documentation of primary data from the field. The fieldwork started with a preliminary study of secondary data and interviews with some key informants, which was then followed up by the qualitative research, where the participative and non-participative observations including in-depth interviews were implemented from March-April 2011, September-December 2011 and March – May 2012. The additional qualitative and quantitative data collection was also conducted later between 2013 to 2016 to update the findings. The qualitative research was followed by a household survey to describe the general picture among the communities where fieldwork was done. The general picture of the communities is important to be examined as an implementation of comparison in the context of the Field of Ethnological Studies in this research, where the villages are distinguished based on some similar factors. The quantitative research on household interviews was implemented from March-May 2012 by using a questionnaire, based on an adapted analytical model of Slikkerveer (1990) which has been applied in various topics of applied ethnoscience by other researchers, including Agung (2005), Leurs (2010), Djen Amar (2010), Ambaretnani (2012), Chirangi (2013), Aiglsperger (2014), and Erwina (2019.). The technique used in the field is in-depth interviews and discussions with different community representatives and key informants, *e.g. village heads, kecamatan heads*, the Mayor of Subang, informal leaders, as well as other village-based institutions.

3.1. Research Methodology

3.1.1 The 'Leiden Ethnosystems Approach'

The ethnosystems approach, the leading approach of this study, has its roots in the classical school of thought of sociology and sociolinguistics called 'ethnomethodology', which was introduced in the 1960s by Garfinkel (1964, 1967, 1974) and Cicourel (1964). The focus of ethnomethodology basically lies in the practical, everyday common-sense reasoning of community members connected to their lay methods (*cf.* Agung 2005). Although useful for the development of interaction research, ethnomethodology lost much of its support, due to the presentation of an over-ordered notion of everyday life, without providing an explanation of the social structures and constraints. In 1991, Slikkerveer reassessed the research methods and techniques available at the time to understand and explain local systems of knowledge, belief and

practices in a diachronic way from a comprehensive emic perspective and developed an advanced, more dynamic ethnomethodology appropriate to be operationalised within the context of sustainable development. He based this applied-oriented approach on an adapted combination of three principles of ethnoscience which he introduced as the 'Leiden Ethnosystems Approach' (cf. Slikkerveer 1991; Ibui 2007; Aiglsperger 2014).

The 'Leiden Ethnosystems Approach' has further been operationalised in policy-based research in projects on the African and Asian continents, studying complex systems of indigenous knowledge and practices, thereby further increasing the understanding and clarification of the interaction process between indigenous and global knowledge (cf. Adams & Slikkerveer 1996). The LEAD Programme of Leiden University adapted the 'Leiden Ethnosystems Approach' as an advanced methodology to gain a comprehensive 'insiders view' in a wide variety of sectors of societies and communities worldwide. Later, Slikkerveer & Decherig (1995) documented that the 'Leiden Ethnosystems Approach' accommodates the analysis of processes of interaction between humans and their environment and that this methodology is capable of taking the significant patterns of use, management and conservation of biocultural diversity into account. In their studies, Agung (2005) and Ibui (2007) demonstrate that the 'Leiden Ethnosystems Approach' is useful for, respectively, the analysis of the conservation behaviour of the Balinese of their island's biocultural diversity and the analysis of the indigenous knowledge, beliefs and practices of wild plants among the Meru of Kenya. Similar studies in applied ethnoscience and development have also been conducted by Djen Amar (2010), Ambaretnani (2012), Chirangi (2013), Aiglsperger (2014), and Erwina (2019). This study in ethno-economics and ethno-development combines those previous researches by means of the ethnosystems approach with the utilisation of a traditional community institution in the Subang District of West Java, in contrast to the existing transitional and modern community institutions. The ethnosystems approach seeks to contribute to the establishment of a common ground for comparison and synthesising analytical principles by providing an interdisciplinary non-normative framework of emic, regional comparative and (pre-)historical analysis (cf. Slikkerveer & Decherig 1995). In a broader context, the ethnosystems approach can be used to analyse dynamic concepts such as beliefs, perceptions, practices and decision-making processes, and interrelate these dynamic concepts with the socio-economic development of various sectors of the communities involved (cf. Ibui 2007; Djen Amar 2010; Ambaretnani 2012; Chirangi 2013; Aiglsperger 2014).

The 'Leiden Ethnosystems Approach' encompasses three basic ethnoscience concepts: the Historical Dimension (HD), the Leiden concept of 'Field of Ethnological Study' (FES) and the Participant's View (PV). Each of the three basic concepts of the ethnosystems approach and their connected research methods and techniques will be discussed in the following paragraphs. The Historical Dimension (HD) facilitates the analysis of the historical dimension of development processes. In this study the focus of the historical perspective lies on those historical developments in sustainable community development and integrated community development in the Sunda Region of West Java, in particular in the Subang District. (cf. Slikkerveer 1999). The Leiden concept of 'Field of Ethnological Study' (FES) is the second basic concept of the ethnosystems approach. Indonesia, confining a wide variety of sub-cultures, can be regarded as a FES. FES is related to the later introduced concept of 'culture area' and is a reference to geographical and environmental regions in which cultural features can be compared among different ethnic groups within that same region (cf. Slikkerveer 1999). The determination of Indonesia as a FES evolved from the extensive ethnological fieldwork by Van Wouden (1935), who observed that a pan-Indonesian culture exists, characterised by similar comparative cultural traits, such as language, kinship and arts, as well as similar perceptions and practices in agriculture, forestry and medicine. This determination of Indonesia as a FES has been further substantiated by various structural anthropologists belonging to the 'Leiden Tradition', for

instance de Jong (1980) and Schefold (1988). FES being a regional comparative research tool shows to be more realistic and less normative than other approaches. FES has been a leading concept during the orientation and documentation phases of the literature study. The field work area for this study is restricted to the Subang District of the West Java province in Indonesia.

During the fieldwork period executed from 2011 to 2012 with some additional visits between 2013 to 2016, the participative observation research technique was used during the qualitative field work, rendering it possible for the researcher to recognise those aspects of the Sundanese society which are part of that pan-Indonesian culture determined by the structural anthropologists. The Participant's View (PV) is related to the anthropological concept of the 'emic view', a technique which pays special attention to the *in situ* aspects of indigenous knowledge. The local population's point of view on their own way of life, including their system of management, use and conservation of natural resources, has become a major guiding principle in policy planning and implementation at the local level (*cf.* Slikkerveer 1999, 2012; Ibui 2007; Chirangi 2013). The emic view, as opposed to the etic view, looks at cultures from within, allowing the researcher to conceptualise the community under study on the basis of local constructs and concepts. Consequently, the emic classifications are those drawn from the way local people perceive things through their own eyes and expressed within their own language, whereas the etic classifications are taken from the way the researcher perceives and classifies the world (*cf.* Martin 1995). In this study, PV is accommodated through qualitative ethnographic research carried out from 2011 to 2012 in the four villages of the Subang District of West Java.

3.1.2 Selection of the Research Setting

The researcher identified Subang as a target location based on an earlier literature study on *Gintingan* as one of the traditional mutual-aid institutions which is still implemented by local people in Subang. The researcher interviewed the author of the previous research, Mr. E. Irawan, prior to the selection of the location. Irawan (*pers.comm* 2011) recommended the researcher to implement this study in Subang, as the people in the area are still implementing *Gintingan*, the traditional institution in contrast to the available transitional and modern institutions. Other researches on *Gintingan* or *Gantangan* have also confirmed that Subang is a Sundanese area in West Java which is still implementing *Gintingan*. Based on those earlier studies on *Gintingan*, the researcher decided to take Subang as the research area for the population of the study. According to the latest statistics of Kabupaten Subang (2017), the District consists of 30 sub-districts and 253 villages. Most people in those sub-districts and villages are still implementing *Gintingan* as part of their culture with various reasons and forms of implementation. However, as explained by Mr. Irawan, most of them use the wedding or circumcision ceremony (*hajatan*) to implement *Gintingan* as the ceremony requires high amounts of money (*cf.* Irawan 1999; Wijaya 2010; Field Note 2011; Prasetyo 2012; BPS Subang 2017).

3.1.3 Selection of Respondents in the Survey

The questionnaire itself was developed since August 2011, and has been discussed several times during the qualitative field work. It uses the established instrument which was firstly introduced by Slikkerveer (1990) and has been used in several researches which are related to applied ethnoscience and development studies. After several adaptations of the questionnaire, particularly with regard to the research area, the questionnaire was finalised in March 2012 and ready to be distributed. The samples involved in the research accommodate the geographic distribution of Subang from the Southern to the Northern Areas of Subang.

Table 3.1 Distribution of the Questionnaire.

Village	Number of Questionnaires	Surveyor	Time of Interview
Sukamelang	100	Kurniawan, Wastim	15 March – 9 May 2012
Bunihayu	80	Mufti Farid, Ahmad, Suherman	15 March – 9 May 2012
		Hendra, Kurniawan	15 March – 9 May 2012
Mayangan	90	Kurniawan, Wawan G	15 March – 9 May 2012
		Ahmad Solihin, Susanti	
		Suherman,	
Cimanglid	90	Kurniawan, Ahmad,	15 March – 9 May 2012
		Suherman, Mufti, Hendra	
Total	360		

Source: Household Survey (2011-2012).

Although it has a different approach, the incorporation of Middle and Southern area of Subang contributes to the limitation of the study by Breman and Wiradi (2002) which only covered the Northern area of Subang. According to the interview with the Director of Regional Planning of Subang Municipality, the development of Subang should be divided into three geographical orientations: the Northern, Central, and Southern Areas of Subang (Field Notes, 2011). After some data cleaning and recategorisation, the remaining questionnaires ready to be analysed were 345 from 360 questionnaires. The other 15 questionnaires cannot be analysed further since they lack data input and many answers were left blank. Table 3.2 shows the final distribution of household samples used in the study.

Table 3.2 Final Distribution of the Questionnaire for the Analyses.

Name of Village	Type of Area	Geographic Area of Subang	Number of Sample Total Interviewed	% age %
Bunihayu	Highland/Rural (mountain)	Southern Area	79	22.9
Cimanglid	Highland/Rural	Southern Area	82	23.8
Mayangan	Lowland/Rural	Central Area	88	25.5
Sukamelang	Central/Urban	Northern Area	96	27.8
Total Number of Samples			345	100

Source: Household Survey (2011-2012).

3.2 Complementary Qualitative and Quantitative Survey

3.2.1 Inventory and Preparation of Research Study

Prior to the fieldwork research, both qualitative and quantitative, the researcher made a preparatory selection of the villages, as well as the preliminary data collection. The researcher distinguishes the villages into three categorical areas: Southern area of Subang, Central area of Subang and Northern area of Subang. For the brief description of the villages, the researcher uses

the following: *Subang dalam Angka* (Statistical Figures of Subang) and *Buku Profil Desa/Kelurahan* (Profiles of the Villages). Those data supported the researcher to have a socio-demographic view of the villages, which helps the researcher to analyse the situation of the research areas. Other supporting data about Subang have been obtained from the public information available on the characteristics of the Subang District. In this context, the researcher stayed at the house of the community leader during the fieldwork. As underscored by Ozor & Nwanko (2008), the role of local leader is very important to be considered in the community development. The advantages of staying with the community leader has facilitated the researcher to gather various data about the villages, with regard to the research subjects.

3.2.2 Qualitative Study in the Four Villages

In order to obtain the aimed result, the study started with an exploratory study, as the initial steps to sharpen the research idea by means of understanding more about the reality of community development and community institutional systems as they were developed in the research area. Preliminary interviews were conducted to understand the case of the Subang District in terms of plural community institutional systems; four villages were initially considered in order to seek the most probable villages to answer the main question of the research. The qualitative study was accomplished in four villages in the Subang District from March 2011 until May 2012, with additional visits between 2013 to 2016.

The study analyses the utilisation of particular indigenous/traditional, transitional and modern community institutions. The methods used for the qualitative research include participative and non-participative observations, in-depth interviews and open-ended interviews with key informants, in combination with literature studies about the related themes. By means of a series of qualitative processes, an exploratory survey in the selected villages was conducted from March to April 2011, whereas the qualitative survey was conducted several times from September 2011 to February 2012, and from March to May 2012, including several additional observations from 2013 to 2016. Interviews were arranged with local community organisers, local figures, local institutions and some government institutions including the Badan Perencanaan Pembangunan Daerah (BAPPEDA) or the District of Development Planning Body, and in particular, the head of *kelurahan* ('village government'): the *lurah* and *kepala desa*. The researcher had also participated in the activity of *Gintingan* and *Andilan*, the Traditional Community Institutions in the research area. Several in-depth interviews, field visits and discussions are also arranged to gain an understanding and obtain qualitative data about the respective villages related to issues/information about local history, village-based community development, local culture, the presence of local community groups, as well as the socio-economic and socio-cultural conditions. In doing the household survey, the author was assisted by some selected interviewers which are the members of local NGOs who are experienced in doing qualitative research as well as quantitative surveys. To ease the interview process, the team of interviewers also lived for a month in the villages prior to the household survey which they involved with.

3.2.3 Quantitative Study in the Four Villages

Regarding the quantification and the interpretation of results from the research which combines between qualitative and quantitative measures, some social scientists try to bridge this qualitative–quantitative divide by employing both approaches in a complementary fashion where each method lends support for the other. In this context, Creswell (2014) suggests a 'sequential transformative approach' in doing the data collection and data analyses as both qualitative and quantitative data are important in explaining the result of this study. The model for quantitative

research requires sampling, collection of impersonal data, and statistical analysis. Following the selection and construction of the research instruments and after discussing the concept of the questionnaire for a household survey with the promotor, in order to maintain methodological consistency, a pilot study was carried out in November-December 2011. The researcher did not conduct any specific test for the pilot study as the researcher uses the existing instrument which has been established by Slikkerveer (1989) and implemented in various researches by Agung (2005), Leurs (2010) Djen Amar (2010), Ambaretnani (2012), Chirangi (2013), Aiglsperger (2014), and Erwina (2019.)

Research using surveys usually draws a sample from a much larger population; the 'parent population' for this research is the population living in the four village communities of the Subang District. This study aims at collecting information on individual households rather than on communities at large, from which the sample has been drawn by targeting individuals who have taken assistance from the services of any of the institutions or organization within the framework of plural community institutional systems. The sampling is of the non-probability sampling strategy type; more precisely, it is purposive sampling with a specific clustering of four village samples. The main goal of purposive sampling is to focus on particular characteristics of a population of interest, which will best enable answering the predetermined research questions. The study involves three geographic areas and involves four village samples, using a purposive sampling method. The sample in this study is a representation of the parent population, which has been the service user of the Plural Community Institutional System (PCINS), as reported over the last year prior to the quantitative survey. (*cf.* Moser & Kalton 1971; Bernard 2002; Creswell 2014; Aiglsperger 2014).

3.3 Composition of the Conceptual Model and Statistical Analysis

Shaffer, Deller & Marcouiller (2006) underscored the importance to use a community-based analysis to represent the development progress from a community perspective. Whether at the level of the individual or household or at the level of the state, according to Grootaert (1999), development outcomes cannot be explained fully by 'traditional' inputs such as labour, land, and physical capital. In this context, the emic view as suggested by Slikkerveer & Decherling (1995) is an important approach to conduct. Following Uphoff (1986) and Warren, Slikkerveer & Brokensha (1995), Grootaert (1999) stresses the importance of Community Institution in order to reap the full contribution to the sustainable community-based development. In relation to indigenous/traditional community institutions involved in the plural community institutional systems, the structure of the questionnaire which is adopted from a pioneering study by Slikkerveer (1990), is aimed at different targets compared to Grootaert (1999), and not for answering the question on how important the community institutions are.

The research is dedicated to inquiring what kind of characteristics of the local people, under particular circumstances, have their preferences in the utilisation of Community Institutional Systems. The preference, namely the utilisation behaviour, is determined by several factors which are characterising the people, the background, and how the background factors influence their decision on utilisation under particular circumstances. The design of the household questionnaire took its foundation from the conceptual model introduced by Slikkerveer (1990; 1999) which discusses the theory in particular on why the questionnaire is structured as such. The household questionnaire opens by firstly introducing the general background of the household. Before any respondent starts the interview, the interviewer asks if the respondent is the *kepala keluarga*, or the household head or *pasangan* or household spouse. In most families in rural West Java, the household head is the husband, except for a family of a widow where the mother becomes the head. If the household head/spouse is not present at the time of the

interview, the interviewer will go to another house, and will go back to the previous household when he or she is available. The respondent is the household head/spouse who was asked whether he/she had a major need and utilised at least one community institution to fulfil the need, within the past year. If so, then the interview continued. If not, then the interview stopped and move to another household.

Table 3.3 General Design Structure of the Household Questionnaire.

SECTION	BLOCK No	Variable Description
A.		<u>General Background</u>
Background Information	0	General Information
B. <u>Independent Variables</u>		
B.1. Predisposing Variables	1	Socio-Demographic Variables
	2	Psycho-Social Variables
B.2. Perceived Needs Variables	3	Perceived Financial Needs Variables
B.3. Institutional Variables	4	Existing Community Institutional Variables
B.4. Enabling Variables	5	Enabling Variables
B.5. Environmental Variables	6	Environmental Location and Zonation Variables
C. <u>Intervening Variables</u>		
	7	Government Intervening Variables
		Private/Commercial Intervening Variables
D. <u>Dependent Variables</u>		
	8	Utilisation of Traditional Institutions
	9	Utilisation of Transitional Institutions
	10	Utilisation of Modern Institutions
E. <u>General Questions</u>		Additional Qualitative Data
		Specific Problems and Solutions

Source: Adapted from Slikkerveer (1990).

The second section represents an investigation to respondents' background of experiences, knowledge and opinions on particular elements of the study. It is a collection of 'Independent Variables', that encompass 6 blocks of variables, comprised of: predisposing socio-demographic variables; predisposing psycho-social variables; enabling variables; variables of financial perceived needs; environmental variables and institutional variables. The third section encompasses 'Intervening Variables', as an investigation towards experiences and opinions regarding policy and promotion intervention from the government or from commercial private institutions. The fourth section comprises 'Dependent Variables' that define the utilisation of traditional community institution, transitional community institution and modern community institution. The fifth section includes additional research materials for qualitative data and the identification of specific problems and solutions.

3.3.1 Construction of the Analytical Model

In constructing the analytical model, the important keyword of this study is utilisation behaviour, and indeed the utilisation of any services provided by an institution, particularly in the use of 'Community Institutional System'; an action resulting from a complex decision-making process. First of all, because decision-making relates to the personal-individual who represents the household perspective, the process cannot avoid the psychological and cultural aspects, and because it is about a variety of accessible community institutions and its services, the analytical model cannot avoid the economic perspective of the particular decision-making process. Hence, the multidimensional perspective is a necessity for constructing the analytical model for this

particular research. From another point of view, the theme of this research aimed to reflect a picture of the socio-cultural and development process, embedded with the processes of poverty alleviation by means of the integrated microfinance management approach (Slikkerveer 2007; 2012) and integrated-community-managed development perspective (2019), through the reflection of people who are participating in the practices of sustainable community development. This explanation strengthens multidimensionality for the construction of the analytical concept of the research, especially because sustainable community development as well as poverty itself are understood as multidimensional phenomena, consistent with Allen (2000) conception about development.

As reflected from the design structure of the household questionnaire, the assumptions of the research reveals that utilisation behaviour on 'Plural Community Support Institutions' applies a multi-dimensional perspective in order to explore and to describe, to explain and to analyse the complex processes of interaction among factors involved in the specific context of the Subang area. Within the agenda of the Indigenous Knowledge Systems, it is also applied to understand the knowledge system of the local villagers of Subang in relation to the decision-making process in the utilisation of Community Institutional Systems. To deepen the understanding and to unlock methodological problems, this multidimensional perspective corresponds to, and seeks solutions for the 'Leiden Ethnosystems Approach', particularly related to the 'Participant's View' (PV), 'Field of Ethnological Study' (FES) and 'Historical Dimension' (HD) (*cf.* Warren, Slikkerveer & Brokensha 1995; Slikkerveer 1999). Within the same roots of the ethnosystems tradition, in his pioneering study of plural medical systems in the Horn of Africa, Slikkerveer (1990) provides approaches to unlock knowledge systems from a multidimensional reality of African plural medical systems, by introducing a conceptual model that distinguishes a set of categories at the individual level: the predisposing factors, enabling factors and perceived morbidity factors, and a set of factors at the system level. Slikkerveer's (1990) multivariate model provides a useful instrument to determine the relationship between the six blocks of factors forming the possible determinants of variation in different types of utilisation behaviour. The pioneering model is applied successfully by a number of researchers in several topics of applied ethnoscience, sustainable community development and conservation behaviour of bio-cultural resources and development, *i.e.* Agung (2005), Ibui (2007), Leurs (2010), Djen Amar (2010), Ambaretnani (2012), Chirangi (2013), Aiglsperger (2014) and Erwina (2019). The 'invisible factors' making up the psycho-social factors have been adapted by Leurs (2010) in her research on Medicinal, Aromatic and Cosmetic (MAC) Plants in Bali, Indonesia. The analytical model of transcultural utilisation behaviour by Slikkerveer (1990) is fundamentally integrating three main levels of 'blocks' of the independent, the intervening and the dependent factors. The analytical model of the ethnoscience approach has maintained the original three main levels of 'blocks' developed by Slikkerveer (1990) and has as such been adopted by Agung (2005), Ibui (2007), Leurs (2010), Djen Amar (2010), Ambaretnani (2012), Chirangi (2013), Aiglsperger (2014) and Erwina (2019).

3.3.2 Mutual Relations Analytical Model

Mutual Relations Analysis is a multivariate analytical model based on the significant variables in the multivariate analysis. It shows what variables in each block significantly influence people's utilisation behaviour in choosing a traditional community institution in comparison with transitional and modern ones. Figure 3.1 shows the Mutual Relations Analytical Model as initially developed by Slikkerveer (1999) and applied in various researches in applied ethnosciences.

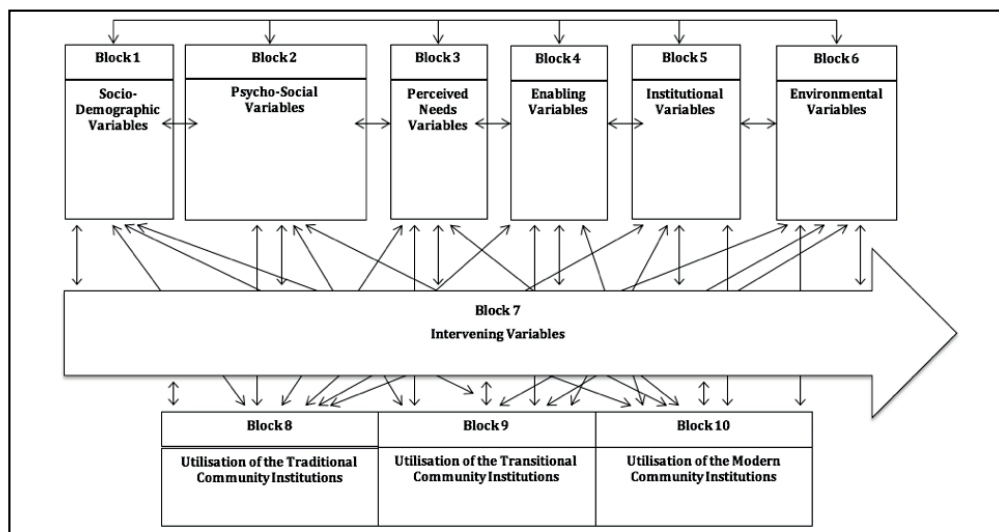


Figure 3.1 The Mutual Relations Analytical Model of Utilisation Behaviour.
Source: Adapted from Slikkerveer (1999).

3.3.3 Multivariate Model of the Utilisation of Traditional, Transitional and Modern Community Institutions

The combination of systematic methodologies to develop a multivariate model, as presented by the various researches, becomes the important reference to indicate and conceptualise the analytical model for the research on the utilisation behaviour of plural community support institutional systems in Subang, West Java. The central reference for developing the model in this research is, retrospectively, based on understanding the model developed by Slikkerveer (1990), which have been applied in several themes of applied ethnoscience by Agung (2005) and the others, including Ibui (2007), Djen Amar (2010), Ambaretnani (2012), Chirangi (2013), Aiglsperger (2014), and Erwina (2019).

3.3.4. Operationalisation of the Multivariate Model of Utilisation

Independent Predisposing Factors

The independent variables refer to a series of socio-cultural background characteristics - a combination of socio-demographic and psycho-social factors, which operate at the level of individual respondents, representing the household samples (*cf.* Slikkerveer 1990; Ambaretnani 2010; Aiglsperger 2014). The concept of socio-demographic factors is represented by variables, such as 'gender', 'household composition', 'age', 'marital status', 'occupation', 'birth place', 'religion', etc. The 'soft' factors such as knowledge, perceptions, beliefs and opinions are best understood by means of quantitative household surveys as represented in the questionnaire which was distributed to the respondents in the four villages of the research area. Table 3.4 demonstrates the operationalisation of the concept of the block of socio-demographic factors into variables, indicators and categories.

Table 3.4 Block 1 - Predisposing Factors: Socio-Demographic Variables.

Concept	Variable	Indicator	Categories
Socio-Demographic	Household type	Type of household	nuclear; extended, other
	Household Composition	Relationship to the household head	household head; spouse; son; daughter; father; mother; father in-law; grandfather; grandmother; grandson; granddaughter; brother; sister; cousin; nephew; niece; son-in-law; brother-in-law; sister-in-law; father-in-law; mother-in-law; other kin
	Sex	Gender	male; female; other
	Age	No. of years alive	less than 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+
	Marital Status	Present marital status	single; married monogamy; married polygamy; divorced/separated; widowed; concubine; other
	Educational Background	Latest school attended with/without graduation	don't know; none; some grade school; primary; completed grade school; some elementary; completed elementary; some secondary; completed elementary; some university; completed university
	Religion	Adherence to religion	don't know; Islam; Catholic; Protestant; Buddhism; Hinduism Confusianism; other
	Profession	Current main occupation	don't know; unemployed; housewife; peasant; farmer, industrial; laborer; entrepreneur; government officer; private employee; security/defence; driver; retired; teacher; other
	Ethno-cultural Groups	Ethnic origin	don't know; Sundanese; Javanese; Minangkabau; Batak; Manado; Makassar; Chinese; other

Source: Adapted from Slikkerveer (1990).

Table 3.5. Block 2 - Predisposing Psycho-Social Variables.

Concept	Variable	Indicator	Categories
Psycho-social variables	knowledge of indigenous/Sundanese tradition	level of knowledge of indigenous/Sundanese tradition	don't know/no knowledge; very little; little; average; much; individual level; very much
	knowledge of indigenous/Sundanese cosmovision;	level of knowledge of indigenous/Sundanese very much	don't know/no knowledge; very little; little; average; much; cosmovision;
	knowledge of <i>gotong royong</i> institution	level of knowledge of <i>gotong royong</i> institution;	no knowledge; very little; little; average; much; very much
	knowledge of existing traditional community institution	type of existing traditional community institution	no knowledge; <i>Gintingan</i> ; perelek; lumbung ekonomi desa; gisahan; arisan

Table 3.5 (continued).

Concept	Variable	Indicator	Categories
	knowledge of existing modern community institution	type of existing modern community institution	no knowledge; village/rural bank; cooperative; BMT; other;
	knowledge of existing transitional community institution	type of existing transitional community institution	no knowledge; village/rural bank; cooperative; BMT; other;
	knowledge of existing traditional community institution for local community support	level of knowledge of existing traditional community institution for local community support	no knowledge; very little; little; average; much; very much
	kind of support of existing traditional community institution for local community support	kind of support of existing traditional community institution for local community support	no knowledge; financial support; medical support; educational support; community support; socio-cultural support; other support;
	form of financial support of existing traditional community institution for local community support	form of financial support of existing traditional community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	form of medical support of existing traditional community institution for local community support	form of medical support of existing traditional community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	form of educational support of existing traditional community institution for local community support	form of educational support of existing traditional community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	form of community support of existing traditional community institution for local community support	form of community support of existing traditional community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	form of socio-cultural support of existing traditional community institution for local community support	form of socio-cultural support of existing traditional community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	form of other support of existing traditional community institution for local community support	form of other support of existing traditional community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	knowledge of existing modern community institution for local community support	level of knowledge of existing modern community institution for local community support	no knowledge; very little; little; average; much; very much
	kind of support of existing modern community institution for local community support	kind of support of existing modern community institution for local community support	no knowledge; financial support; medical support; educational support; community support; socio-cultural support; other support;

Table 3.5. (continued).

Concept	Variable	Indicator	Categories
	form of financial support of existing modern community institution for local community support	form of financial support of existing modern community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	form of medical support of existing modern community institution for local community support	form of medical support of existing modern community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	form of educational support of existing modern community institution for local community support	form of educational support of existing modern community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	form of community support of existing modern community institution for local community support	form of community support of existing modern community institution for local community support	no knowledge; not applicable; money; goods; services of other forms;
	form of socio-cultural support of existing modern community institution for local community support	form of socio-cultural support of existing modern community institution for local community support	no knowledge; not applicable; money; goods; services of other forms;
	form of other support of existing modern community institution for local community support	form of other support of existing modern community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	knowledge of existing transitional community institution for local community support	level of knowledge of existing transitional community institution for local community support	no knowledge; very little; little; average; much; very much
	kind of support of existing transitional community institution for local community support	kind of support of existing transitional community institution for local community support	no knowledge; financial support; medical support; educational support; community support; socio-cultural support; other support;
	form of financial support of existing transitional community institution for local community support	form of financial support of existing transitional community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	form of medical support of existing transitional community institution for local community support	form of medical support of existing transitional community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	form of educational support of existing transitional community institution for local community support	form of educational support of existing transitional community institution for local community support	no knowledge; not applicable; money; goods; services of other forms

Table 3.5. (continued).

Concept	Variable	Indicator	Categories
	form of community support of existing transitional community institution for local community support	form of community support of existing transitional community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	form of socio-cultural support of existing transitional community institution for local community support	form of socio-cultural support of existing transitional community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	form of other support of existing transitional community institution for local com. support	form of other support of existing transitional community institution for local community support	no knowledge; not applicable; money; goods; services of other forms
	belief in traditional Sundanese lifestyle as good for health and well-being	level of belief in traditional Sundanese lifestyle as good for health and well-being	no knowledge; very little; little; average; much; very much;
	belief in modern cosmovision lifestyle as good for health and well-being	level in belief on modern cosmovision as good for health and well-being	no knowledge; very little; little; average; much; very much;
	opinion on the community support/service of traditional institutions	level of opinion on the community support/service of traditional institutions	no opinion; very low; low; average; high; very high
	opinion on the community support/service of modern institutions	level of opinion on the community support/service of modern institutions	no opinion; very low; low; average; high; very high
	opinion on the community support/service of transitional institutions	level of opinion on the community support/service of transitional institutions	no opinion; very low; low; average; high; very high

Source: Adapted from Slikkerveer (1990).

Independent Perceived Needs Variables

Among community-based development practitioners, there is one factor which influences people's behaviour in the utilisation of available community institutions. This is the 'perceived needs' factor. It is an inherent variable within the people, which motivates them to behave with such a particular behaviour. According to Kizlik (2010), the assessment to this 'perceived need' comprises a systematic process for determining and addressing gaps or the disparity between current conditions and desired conditions or 'wants', or between the 'expected' and the 'perceived'. The following Table 3.6 presents the selected of perceived needs factors: Financial Needs, Medical Needs, Educational Needs, Communication Needs, and Socio-Cultural needs.

Table 3.6 Block 3 - Perceived Needs Variables.

Concept	Variable	Indicator	Categories
Perceived needs and satisfaction variables for using financial service at individual household level	general perceived needs by local people in the community	type of perceived needs expected by local people in the community	don't know; no perceived needs for financial support; for medical support; for educational support; for community support; for socio-cultural support; for other support;

Table 3.6 (continued).

Concept	Variable	Indicator	Categories
	general financial perceived needs by local people in the community	type of financial perceived needs by local people in the community	don't know; there are no financial needs; by support from traditional institutions; by support from modern institutions; by support from transitional institutions; by support from other institutions;
	general medical perceived needs by local people in the community	type of medical perceived needs by local people in the community	don't know; there are no medical needs; by support from traditional institutions; by support from modern institutions; by support from transitional institutions; by support from other institutions;
	general educational perceived needs by local people in the community	type of education perceived needs by local people in the community	don't know; there are no educational needs; by support from traditional institutions; by support from modern institutions; by support from transitional institutions; by support from other institutions;
	general community perceived needs by local people in the community	type of community perceived needs by local people in the community	don't know; there are no community needs; by support from traditional institutions; by support from modern institutions; by support from transitional institutions; by support from other institutions;
	general socio-cultural perceived needs by local people in the community	type of socio-cultural perceived needs by local people in the community	don't know; no socio-cultural needs; by support from traditional institutions; by support from modern institutions; by support from transitional institutions; by support from other institutions;

Source: Adapted from Slikkerveer (1990).

Independent Enabling Variables

At the conceptual level, Slikkerveer (1990) has proven that factors at the individual level can be 'elevated' to the systems level to allow the comparative analysis between factors related to both individuals and systems (*cf.* Slikkerveer & Dechering 1995; Slikkerveer 2002; Quah & Slikkerveer 2003). The variables in the block of enabling factors are: family income, family expenses, and socio-economic status (SES), which is basically comprised of a compound of variables such as land ownership etc.

Table 3.7. Block 4 - Enabling Variables.

Concept	Variable	Indicator	Categories
Variables of enabling factors of household at individual level	Household head income	total amount of the head's household income during the past year (monthly in rupiah)	don't know; less than 500 thousand; 500.000 – 1 million; 1.000.001 – 1.500.000 1.500.001 – 2.000.000; 2.000.001 – 2.500.000; 2.500.001 – 3.000.000 > 3.000.000
	Household wife /spouse income	total amount of household income during the past year (monthly in rupiah)	don't know; less than 500 thousands; 500.000 – 1 million; 1.000.001 – 1.500.000 1.500.001 – 2.000.000; 2.000.001 – 2.500.000; 2.500.001 – 3.000.000 > 3.000.000

Table 3.6 (continued)

Concept	Variable	Indicator	Categories
	Other members' income	total amount of other members' income during the past year (monthly in rupiah)	don't know; less than 500 thousand; 500.000 – 1 million; 1.000.001 – 1.500.000 1.500.001 – 2.000.000; 2.000.001 – 2.500.000; 2.500.001 – 3.000.000 > 3.000.000
	Socio-economic status by respondent	level of socio-economic status by respondent rich; very rich;	don't know; very poor; poor; average;
	Socio-economic status by interviewer	level of socio-economic status by interviewer rich; very rich;	don't know; very poor; poor; average;
	Cost to use traditional institution	cost level of using traditional institution	don't know; no costs; very little; little; medium; much; very much
	Cost to use modern institution	cost level of using modern institution	don't know; no costs; very little; little; medium; much; very much
	Cost to use transitional institution	cost level of using transitional institution	don't know; no costs; very little; little; medium; much; very much
	Transport cost to use traditional institution	transport cost level of using traditional institution	don't know; no costs; very little; little; medium; much; very much
	Transport cost to use modern institution	transport cost level of using modern institution	don't know; no costs; very little; little; medium; much; very much
	Transport cost to use transitional institution	transport cost level of using transitional institution	don't know; no costs; very little; little; medium; much; very much
	General spending of household	order of general spending of household	don't know; no costs; food & drink; clothes; shelter; school/education;
	Savings ability	answer to savings ability	healthcare; transportation; leisure/recreation; other

Source: Adapted from Slikkerveer (1990).

The enabling factors of socio-economic status are determined with subjective and objective perceptions; the objective ones are measured by a range of variables of ownership of material goods plus income and expenses, whereas subjective perceptions use the respondents' own opinions on their economic status in the community.

Independent Institutional Variables

The institutional factors are actually represented in the model to make available information on the nature of the ecosystem among institutions, especially related to the interaction of various financial institutions in the community. The specific variables presented in Table 3.8 are the types of existing community institutions available in the community, whether indigenous, transitional or modern institutions.

Table 3.8. Block 5 - Institutional Variables.

Concept	Variable	Indicator	Categories
Institutional variables at individual HH Level	Objective of traditional community institution	Type of objective of traditional community institution	don't know; no objectives; financial support; for medical support; educational support; communication support; socio-cultural support; for other support
	Type of objective of modern community institution	Type of objective of modern community institution	don't know; no objectives; financial support; medical support; educational support; communication support; socio-cultural support; for other support
	Objective of transitional community institution	Type of objective of transitional community institution	don't know; no objectives; financial support; medical support; educational support; communication support; socio-cultural support; for other support
	Age of traditional community institution	Year of existence of traditional community Institution	don't know; 25 years or older; 20-24 years; 15-19 years; 10 – 14 years; 5-9 years 0 – 4 years;
	Age of modern community institution	Year of existence of modern community institution	don't know; 25 years or older; 20-24 years; 15-19 years; 10 – 14 years; 5-9 years 0 – 4 years;
	Age of transitional community Institution	Year of existence of transitional community institution	don't know; 25 years or older; 20-24 years; 15-19 years; 10 – 14 years; 5-9 years 0 – 4 years;
	Organisational structure of traditional institution	Type of organisational structure of traditional	don't know; closed institution; open institution; other institution
	Organisational structure of modern institution	Type of organisational structure of modern	don't know; closed institution; open institution; other institution
	Organisational structure of transitional institution	Type of organisational structure of transitional	don't know; closed institution; open institution; other institution
	Input to support traditional institution	Source of input for traditional institution	don't know; members of traditional institution; members of the local community; professionals; others
	Input to support modern institution	Source of input for modern institution	don't know; members of modern institution; members of the local community; professionals; others
	Input to support for transitional institution	Source of input for transitional institution	don't know; members of transitional institution; members of the local community; professionals; others

Source: Adapted from Slikkerveer (1990).

Independent Environmental Variables

The Environmental factors are actually taken into the model to give information about the physical location of the village and how it is related to the presence of Community Institutional Systems in the community. Variables such as the environmental locations, zonation locations and family residential status in the community represents the relative location of the village and the respondent in regard to the presence of the nearest traditional institution, modern institution and transitional institution (*cf.* Table 3.9).

Table 3.9. Block 6 - Environmental Variables.

Concept	Variable	Indicator	Categories
Environmental factors at the individual level	Environmental location	Type of environmental location of the village	don't know; rural; semi-rural/semi-urban; urban; other
	Zonation of the location	Type of zonation of the village	don't know; mountainous; plains; low-land; coastal; other
	Family residential status	Type of residential status in the village	don't know; indigenous; migrant/non-local other

Source: Adapted from Slikkerveer (1990).

Intervening Variables

These intervening factors actually depict the characteristics related to external dynamic interventions at the local community level. At the theoretical level, there are two most powerful players determining the dynamics of the development of a community: firstly the power of the state, represented by the intervention of the government; and secondly the power of the market represented by the intervention of the commercial private sector. Such dynamism is generally regarded as impacts on external factors or external agencies, at both the individual and system levels, which may influence or possibly create new behaviour which is different from the previous traditional ways of life (*cf.* Leurs 2010; Djen Amar 2010). The influx of interventions entering a community of villages is determined by the creation and implementation of policy, regulations and promotions from the sides of government and commercial private interventions. Details of the intervening variables, indicators and categories are represented in Tables 3.10.

Table 3.10 Block 7 - Intervening Factors.

Concept	Variable	Indicator	Categories
Intervening Variables Using the institutions	government policy to influence traditional institution	level of government/regulation/policy influence	don't know; none; very little; little; average; much; very much
	government policy to influence modern institution	level of government regulation/policy influence	don't know; none; very little; little; average; much; very much
	government policy to influence the use of transitional institution	level of government regulation/policy influence	don't know; none; very little; little; average; much; very much

Table 3.10 (continued)

Concept	Variable	Indicator	Categories
	government policy to influence the use of traditional institution	government influence in the use of traditional institution	don't know; financial support; medical support; educational support; community support; socio-cultural support; other support
	government policy to influence the use of modern institution	government influence in the use of modern institution	don't know; financial support; medical support; educational support; community support; socio-cultural support; other support
	government policy to influence the use of transitional institution	government influence in the use of transitional institution	don't know; financial support; medical support; educational support; community support; socio-cultural support; other support
	government promotion to influence transitional institution	level of government promotion of influence	don't know; none; very little; little; average; much; very much
	government promotion to influence modern institution	level of government promotion of influence	don't know; none; very little; little; average; much; very much
	government promotion to influence transitional institution	level of government promotion of influence	don't know; none; very little; little; average; much; very much
	government promotion to influence the use of traditional institution	government influence in promotion of traditional institution	don't know; financial support; medical support; educational support; community support; socio-cultural support; other support
	government promotion to influence the use of modern institution	government influence in promotion of modern institution	don't know; financial support; medical support; educational support; community support; socio-cultural support; other support
	government promotion to influence the use of transitional institution	government influence in promotion of transitional institution	don't know; financial support; medical support; educational support; community support; socio-cultural support; other support
	private regulation to influence traditional institution	level of private regulation of influence	don't know; none; very little; little; average; much; very much
	private regulation to influence modern institution	level of private regulation of influence	don't know; none; very little; little; average; much; very much
	private regulation to influence transitional institution	level of private regulation of influence	don't know; none; very little; little; average; much; very much
	private policy to influence the use of traditional institution	private influence in the use of traditional institution	don't know; financial support; medical support; educational support; community support; socio-cultural support; other support

Table 3.10 (*continued*)

Concept	Variable	Indicator	Categories
	private policy to influence the use of modern institution	private influence in the use of modern institution	don't know; financial support; medical support; educational support; community support; socio-cultural support; other support
	private policy to influence the use of transitional institution	private influence in the use of transitional institution	don't know; financial support; medical support; educational support ; community support; socio-cultural support; other support
	private promotion to influence traditional institution	level of private promotion of influence	don't know; none; very little; little; average; much; very much
	private promotion to influence modern institution	level of private promotion of influence	don't know; none; very little; little; average; much; very much
	private promotion to influence transitional institution	level of private promotion of influence	don't know; none; very little; little; average; much; very much
	private promotion to influence the use of traditional institution	private influence in promotion of traditional institution	don't know; financial support; medical support; educational support; community support; socio-cultural support; other support
	private promotion to influence the use of modern institution	private influence in promotion of modern institution	don't know; financial support; medical support; educational support; community support; socio-cultural support; other support
	private promotion to influence the use of transitional institution	private influence in promotion of transitional institution	don't know; financial support; medical support; educational support; community support; socio-cultural support; other support

Source: Adapted from Slikkerveer (1990).

The Dependent Variables

The following Tables 3.11, 3.12 and 3.13 represent Block 8, Block 9, and Block 10, which represent the main community institutions utilised during the course of the latest year before the research was conducted. The variables represent the existing community institutions, which were preferred to be chosen by the respondents, given the sets of their circumstances within the last one-year period from the date when the interview was conducted.

Table 3.11 Block - 8 Dependent Variable: Utilisation of Traditional Institutions.

Concept	Variable	Indicator	Categories
Dependent factors of the main traditional institution used by the household	the main traditional institution is used as a community institution	the main traditional community institution in the last year	Yes; No

Source: Adapted from Slikkerveer (1990).

Table 3.12 Block - 9 Dependent Variable: Utilisation of Transitional Institutions.

Concept	Variable	Indicator	Categories
Dependent factors of the main transitional institution used by the household	the main transitional institution is used as a community institution	the main transitional community institution in the last year	Yes; No

Source: Adapted from Slikkerveer (1990).

Table 3.13 Block – 10 Dependent Variable: Utilisation of Modern Institutions.

Concept	Variable	Indicator	Categories
Dependent factors of the main modern institution used by the household	the main modern institution is used as a community institution	the main modern community institution in the last year	Yes; No

Source: Adapted from Slikkerveer (1990).

3.4 Statistical Analyses

3.4.1 Bivariate and Mutual Relations Analysis

Based on the quantitative research of the household, the dataset from four village samples were formed. The dataset is the basis for the statistical analysis presented in this study, based on the number of households involved in the survey, in which the number (n) equals 345. The household database is the basis for the quantitative analysis of the four village communities in the Subang District of West Java, with regard to their experiences, knowledge, preferences and opinions related to the patterns of the utilisation of community institutions: the use of Indigenous/Traditional Institutions, Transitional Institutions and Modern Institutions.

The dataset is used for descriptive cross-tab bivariate statistics, which are presented where appropriate to substantiate the qualitative findings in relation to the different topics presented in Chapters IV to VII. Descriptive and cross-tab bivariate or multivariate statistical techniques are used for the dataset derived from the household survey in four village communities of Bunihayu Village, Cimanglid Village, Sukamelang Village and Mayangan Village, in the Subang District. The bivariate analysis is used to examine whether one variable relates to another and more specifically what the shape, direction and strength of the relationship is (*cf.* Weinberg & Abramowitz 2002). The focus of a bivariate analysis is the association between two variables, and although it does imply co-variation, it should not be mistaken for causation (*cf.* Rosnow & Rosenthal 2005; Field 2009).

The cross-tabulation technique is used in this study to establish whether the difference observed in the cross-tabulation of the sample represented a real difference in the population as a whole. Pearson's Chi-square (χ^2) test of independence permits such a judgement; it allows determination of whether or not there is a statistically significant association between two variables (*cf.* Miller *et al.* 2002). The confidence level for this study is set at 95%, which could result in the mere dichotomy of 'significant' versus 'not significant'; hence, a differentiated assessment is used. In analysing the significance of statistical data, the researcher used the rules introduced by Agung (2005), Ambaretnani (2012) and Aiglsperger (2014), which are as follows:

Level of significance	Interpretation
$\chi^2 > 0.15$	not significant
$0.15 > \chi^2 > 0.10$	indication of significance
$0.10 > \chi^2 > 0.05$	weakly significant
$0.05 > \chi^2 > 0.01$	strongly significant
$0.01 > \chi^2 > 0.001$	very strongly significant
$\chi^2 < 0.001$	most strongly significant

Pearson's Chi-square can be suitably used for categorical data, which are by definition not continuous. Although Pearson's Chi-square does not rely on such assumptions as having continuous normally distributed data as most statistical tests, two important assumptions must always be fulfilled: firstly, each respondent can score only in one cell of the cross-tabulation and secondly, no expected frequencies should be below 1 and no more than 20% of expected frequencies should be below 5. As the two types of data scales, both ordinal and nominal, have been used, Cramer's V is used to provide additional examination of the level of statistical significance (*cf.* Field 2009). After the significant variables are identified, Mutual relations Analysis is applied in this study (*cf.* Figure 3.1). Mutual Relations Analysis is a multivariate analytical model which is built based on the significant variables in the bivariate analysis. It shows what factors in each block significantly influence people's utilisation behaviour in choosing a traditional institution in comparison with the transitional and modern ones.

3.4.2. Multivariate of Non-Linear Generalized Canonical Correlation Analysis: OVERALS

The conceptual model of the multivariate models of the utilisation behaviour in Plural Community Institutional Systems is based on some earlier empirical findings; there are various explanatory variables that influence people's behaviour in the utilisation of any available system. In this context, the relations between the explanatory variables, represented by the independent and intervening variables, with the dependent variables need to be addressed. There is a need to identify the relations between the blocks of variables in the system through a particular quantitative method (*cf.* Slikkerveer 1990; Agung 2005; Ibui 2007, Leurs 2010).

This study uses the multivariate analysis to analyse the utilisation of community institutions in the four villages in the Subang District. The multivariate analysis of the household dataset makes it possible to analyse the community members' behaviour in the patterns of the interrelationships of the large set of independent, intervening and dependent variables. When there are multiple independent and dependent variables in a particular design, which in this study include three dependent variables, the design is said to be multivariate (*cf.* Tabachnick & Fidell 2001). The multivariate analysis measures the association of all the relationships, which are by nature more complex, because of the multiple relationships of the predictor variables (independent and intervening variables) not only with the dependent variables, but also between and among the dependent variables. By using multivariate analysis techniques, it is possible to determine which variables have the strongest impact on the interrelationship of the variables. The classical multivariate analysis assumes that each variable has *a priori* quantification and can be treated as numerical data (*cf.* Van de Geer 1993; Aiglsperger 2014).

In this study, although some variables could be considered to be (quasi) interval data, treating all data numerically would have been an oversimplification of the complexity of this dataset. Therefore the non-linear multivariate analysis, which does not have the same *a priori* assumption of the classical multivariate analysis, is the appropriate analysis to use. In his study, Agung (2005) documented the link between the conceptual model and the Non-Linear Generalized Canonical Correlations or OVERALS multivariate statistical analysis. Following the example of

Agung (2005), Ibui (2007), Leurs (2010), as well as Djen Amar (2010), Ambaretnani (2012), Chirangi (2013), Aiglsperger (2014), and Erwina (2019) the OVERALS analysis is used in this study. The OVERALS analysis is a non-linear generalized canonical correlation analysis (*cf.* Van de Geer 1993), which allows the inclusion of variables with different measurement levels, including those with nominal and ordinal levels, in the analysis and allows different sets of variables to be worked with. In this study, the set of the independent and intervening variables form the first set, while the dependent variables form the second set.

3.4.3 Multiple Regression Analysis

The general purpose of the Multiple Regression Analysis is to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable. Following the examples of Agung (2005), Ibui (2007), Leurs (2010), Djen Amar (2010), Ambaretnani (2012), Chirangi (2013), Aiglsperger (2014), and Erwina (2019), a Multiple Regression Analysis is used on the basis of the individual OVERALS analyses between each block of variables with all other blocks of variables in the model. A specific Multiple Regression Analysis is used here to calculate the relative importance of the block of variables and the block of dependent variables. The most commonly used multivariate measures of associations can be expressed as functions of the ‘eigenvalues’ of the product matrix. In this analysis, the multiple correlation coefficients (pd) of the individual OVERALS analyses will be used to measure the association. The multiple correlation co-efficient (pd) is related to the ‘eigenvalues’ (Ed). The formula used to calculate the pd is $pd = 2 \times Ed - 1$ (*cf.* Van der Burg 1988).

The approach to the Multiple Regression Analysis respects the pre-defined block of factors presented in the multivariate model. This model, firstly introduced by Slikkerveer (1990) and later implemented in different studies of applied ethnoscience by Agung (2005), Ibui (2007), Leurs (2010), Djen Amar (2010), Ambaretnani (2012), Chirangi (2013), Aiglsperger (2014), and Erwina (2019), widens the perspective on culture and also permits the assessment of the cognitive and behavioural components of particular groups or communities as ‘systems’ in a rather holistic mode, hence generating a value relation towards policy making. The Multiple Regression Analysis of the block of factors gives an indication on which aspects further policies should be developed and at which point policies should be concentrated in order to heighten the probability of positively affecting the intended change in the behaviour of the community.