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 II THEORETICAL ORIENTATION

This chapter seeks to indicate and discuss specific concepts, definitions and related theories used as a point of embarkation of the present study on the patterns of health care utilisation behaviour. Within the perspective of a pluralistic medical system, the study of the cross-cultural comparison of medical systems has led to an ethnomedical approach which is distinct from the biomedical paradigm (*cf.* Slikkerveer 1990). The chapter begins with the theory of illness belief and the health-seeking process. Paragraph 2.1 highlights the literature on the health care-seeking process and the development of the medical system. This section concentrates on the impact of cultural beliefs about illness and disease on the patterns of health care utilisation, particularly how these cultural beliefs shape the patterns of health care utilisation in a given community.

Slikkerveer (1990) defines health-related behaviour as an adaptive practice to prevent illness and promote health to ensure the sustainability of a particular community. On that account, communities around the world have developed medical systems to maintain their well-being. During the course of their development, medical social sciences, such as medical anthropology and medical sociology, have published a range of definitions for 'medical system'. The coexistence of these forms of medical systems suggests movement towards medical pluralism.

Subsequently, Paragraph 2.2 conceptualises the medical pluralism paradigm, consisting of three separates but potentially overlapping medical systems. Each medical system, namely the traditional, transitional, and modern medical system, is further discussed in the context of identification and recent developments. In the present study, medical pluralism refers not only to the co-existence of multiple health providers but also applies to the concept of health and illness, multiple categories of healers and health workers, and multiple choices between and within the systems.

Following, Paragraph 2.3 highlights studies on patterns of health care utilisation and their role in the treatment of diabetes mellitus. This paragraph starts with the explanation of pathology and the complexity of the treatment of diabetes mellitus. One of the approaches to the treatment and prevention of diabetes mellitus is to examine the illness behaviour and patterns of health care utilisation behaviour in the target community. The study on the patterns of health and illness behaviour have gained renewed interest as an approach to the treatment of chronic disease such as diabetes mellitus.

As the present study highlights the importance of the traditional medical system and indigenous knowledge system in the plural medical system configuration, Paragraph 2.4 discusses the concept of indigenous medical knowledge and ethnopharmacology. The concept of traditional medicine is closely linked to the concept of Indigenous Knowledge Systems (IKS) which are defined as a distinct body of knowledge to a given culture or society (*cf.* Slikkerveer & Brokensha 1995). In the health sector, IKS have been referred to as Indigenous Medical Knowledge Systems (*cf.* Aiglsperger 2014).

2.1 Health and Illness Behaviour and the Health-Seeking Process

In the field of medical anthropology, medicine, health, and illness are different cultural categories and each culture has its own logic and means to deal with these matters. Every culture has its own explanation for the ill-health concept. For example, the indigenous theory of the Rajasthan ethnic group assumes that illness is the result of the imbalance of body fluids, life activities, spiritual action, or supernatural elements. They have rules for translating and linking symptoms with aetiologies and interventions for illness (*cf.* Bhasin 2007).

Researchers have studied the socio-cultural aspects of health and illness in relation with patterns of health care utilisation behaviour for more than fifty years (Young, 2004). Slikkerveer (1990) explains that the patterns of health care utilisation in the community are not only differentiated by social inequality but also by health and illness behaviour, as well as the availability of a medical system. The term 'illness behaviour' was first introduced by Mechanic (1961) to describe how symptoms are perceived and responded to by the person who experiences discomfort and malfunction in the body. In his view, illness behaviour has a socio-cultural complex and social construction. While a patient's behavioural response to a medical condition varies among subjects, the greater this variation, the less likely the course of a disease can be predicted solely by biomedical factors (*cf.* Laura Sirri *et al*., 2013). Consequently, the biomedical approach to sickness is inadequate to describe the complexity of illness behaviour.

In the past five decades, the conceptualisation of illness behaviour has been modified to include cultural, psycho-social, and demographic factors which influence the response of the individual to an illness. In its broadened concept, illness behaviour encompasses macrosocial and microsocial aspects of health-seeking behaviour (*cf.* Young, 2004). Several studies in the field of medical anthropology have focused on patterns of 'illness behaviour', 'health care utilization behaviour', 'health-seeking behaviour', or 'health-related behaviour' (*cf.* Babar & Hatcher 2004; Atwine & Katarina 2016; Dawood *et al*. 2017; Lim *et al*. 2019).

Most research on the subject of illness behaviour has been focussed on the micro-sociological field of sociopsychology and socio-cultural research. Socio-cultural research in illness behaviour broadens the inquiry of socio-psychological research to include cultural differences in action and interaction (*cf.* Young 2004). Beginning with the initial formulation of the sick role by Parsons (1951), the structure of the sick role will be the starting point for further discussion. According to Parsons (1951), illness disrupts normal life and social functions, and is behaviourally deviant. It is not a biological or psychological condition but a social role, namely a 'sick role', characterised by the obligations of the sick person to the doctor-patient relationship. Additionally, Parsons (1951) argues that the sick role obliges patients to do everything possible to achieve 'complete recovery'. This would imply that the sick role does not apply to chronic illness. Studies on patients with chronic illness reveal that they perceive the sick role differently from those with acute illness (*cf.* Young 2004). Furthermore, Parsons' conceptualisation of the 'sick role' assumes that the power to manage an illness is in the caregiver's hands. Nevertheless, with the development of medical information, expansion of over-the-counter (OTC) medicine, and self-help groups, this caregiver-patient relationship becomes vague (*cf.* Hardey 1999).

Another micro-sociological approach in the subject of illness behaviour is Suchman's Stage of Illness Model. The model is actually built based on Parson's sick role model but adds some details to the timeline of doctor-patient relationships and acknowledges the variability of behaviour in the doctor-patient relationship. Suchman's model allows for the explanation of the concept of 'healer shopping', fragmentation of care, and delay in seeking care (cf. Young 2004). Edward Suchman (1965) devised an approach for studying illness behaviour which involves a decision-making process by the individual at each stage. Five key stages of illness behaviour according to Suchman (1965) are: (i) experience of symptoms, (ii) assumption of the sick role, (iii) contacting medical care, (iv) dependent patient role, and (v) recovery and rehabilitation. The decisions made by individuals at each stage determine whether the sequence of the stage is continued or otherwise. Positive illness perception is established when illness is perceived as a normal part of life (*cf*. Joshi *et al.* 2015).

Slikkerveer (1990) argues that a distinction between stages of illness behaviour allows for a description of illness as: '*a dynamic process of successive choices from alternative forms of behaviour*'. Illness behaviour of patients may widely influence a patient's decision to seek care. Slikkerveer (1990) observes that during the stage of assumption of the sick role, the individual

may choose a care practice (either internal or external). Illness behaviour can also be referred to as health-seeking behaviour or sick-term behaviour (*cf.* Mackian 2002). The ethnographic study on illness beliefs and how individuals approach their healing process during their sick role stage is known as the health-seeking process (*cf.* Singer & Baer 2007).

2.1.1 Typologies of Medical Systems

Beliefs on health, the cause of illness and its treatment have formed medical systems which are a part of the cultural system of any community. They are created as the social responses to illness and the sick role (*cf.* Bhasin 2007). Medical systems, like all social institutions, are shaped by social processes. Furthermore, Bhasin (2007) elaborates that medical systems are an integral part of all cultures and include the totality of health knowledge, beliefs, skills, and practices of every community. As cultural constructs, the systems are adaptively fluid, changing over time, and responding to different social, religious, economic, political, and ecological conditions of societies (*cf.* Holleman 1991). Communities around the world have developed medical systems to maintain their well-being (*cf.* Langdon & Wiik 2010).

During the course of their development, medical social sciences, such as medical anthropology and medical sociology, have published a range of definitions for medical systems' or health care systems. Medical systems have been depicted by medical anthropologists as knowledge, practices and specific institutions in response to experiences or episodes of illness and misfortune, whether individually or collectively (*cf.* Langdon & Wiik 2010). An early definition is coined by Dunn (1976) who states that a medical system is "... *the pattern of social institutions and cultural traditions that evolves from deliberate behaviour to enhance health, whether or not the outcome of particular items of behaviour is ill health"*. Referring to this notion, Dunn regards the cultural approach as being important in describing a medical system. It has been described as embodying a structured system of logic reflective of attitudes towards the world of the cultures where people are embedded.

Using a more general definition, Glick (1977) defines a medical system as: '*a patterned set of ideas and practices having to do with illness*'. In another study, Fabrega & Manning (1979) prefer to use the term 'medical care system' to incorporate the different beliefs, practices, knowledge, and personnel involved in providing health care services to cure illnesses. Following those characteristics, Islam (2016) conceptualises medical systems as: '*a total organisation of cultural and social practices, including behavioural and technical aspects, which are aimed at achieving health and preventing illness*'.

Kleinman (1980) categorises three different yet overlapping sectors of health care as the popular sector, professional sector, and folk sector. The popular sector is defined as: *'the lay, non-professional, non-popular culture arena in which illness is first defined and health care activities initiated'*. The professional sector is referring to the '*organised healing profession including modern scientific medicine and professionalised indigenous medical system'*. The folk sector comprises '*non-professional medical healers whose medical techniques are more dominantly related to the popular sector than the professional sector* (cf. Kleinman 1980). Elaborating Kleinman's idea, Young (1990) approaches a medical system as: '*a set of medical traditions and medical sectors – understood as both the cognitive and the experimental background of the disease, as operational areas of diagnosis and therapy – that are used by specific social or community groups.*'

2.1.2 The Study of Health Care Seeking Behaviour

Health-seeking behaviour is defined as all activity undertaken by patients for achieving a healthy state. Health-seeking behaviour is studied within the broader concept of health behaviour (*cf.* Mackian 2002). This behaviour consists of seeking treatment from health

providers, self-medication, or ignoring illness (*cf.* Khajeh *et al*. 2019). Researchers are interested in what determines the use of a health service or health system and what influences individuals to behave differently as a response to their illness. Studies emphasising the health-seeking behaviour have been broadly classified into two types: firstly the study which emphasises the utilisation of a formal system, or *health care-seeking behaviour*, and secondly those which emphasise the health or illness process, or *health-seeking behaviour*.

Several studies focus specifically on seeking health care or the utilisation of a formal system. Nevertheless, the data are not only collected in a formal system but also as self-medication, contact with traditional healers, or visits to unofficial medical personnel (*cf.* Ahmed *et al*. 2000). Consistent findings in many studies reveal that an individual will prefer a traditional village homeopath, or untrained allopathic doctor to health care professionals for certain illnesses (*cf.* Ahmed *et al*. 2000; Kolling *et al*. 2010; Votova 2012). Recently, there is growing recognition that for some health problems in developing countries, traditional and unqualified practitioners are important resources or main providers of care (*cf.* Mackian 2002).

There is considerable variation in health-seeking behaviour among acute illness and chronic illness patients. Studies indicate that health-seeking behaviour can be affected by the socio-economic conditions of the patient, age, gender, individual preferences, diseases, and accessibility of health providers (*cf.* Kolling *et al*. 2010; Sirri *et al*. 2013; Khajeh *et al*. 2019; Rasul *et al*. 2019). Furthemore, studies demonstrate that the decision to employ the health services of a particular medical provider is influenced by socio-economic variables, gender, age, social status of women as health-decision makers, type of illness, and perceived quality of the service providers (*cf.* Tipping & Segall 1995). Individual health-seeking behaviour is one of the determinants which influence the utilisation of the medical system among different communities (*cf.* Clewley *et al*. 2018).

The identification of key factors in the health-seeking process clearly has implications in the health system development. Studies in this field have emerged in response to providing good quality and accessible health services. Furthermore, there is growing recognition that health care-seeking behaviour and local knowledge need to be taken into account in the development of programmes and interventions to promote health in various contexts (*cf.* Mackian 2002). Slikkerveer (1990) concluded that empirical studies of help-seeking and utilisation behaviour have provided a realistic basis for health care planning and programming.

When identifying the factors in the utilisation of medical systems, there are two approaches of identification: firstly, by categorising the type of barriers or factors between patients and health services, and secondly, by the type of processes or pathways involved in the decision-making. In the first approach, the barriers or factors are generally categorised under the division of geographical, social, economic, cultural, and organisational factors. Furthemore, these categorisations are placed into key spheres of influence, namely informal, infrastructure, and formal. The second approach is by categorising the process or pathways. This approach allows for the identification of key factors where there may be a delay in seeking care (*cf.* Bedri 2001; Mackian 2002).

2.2 Conceptual Framework of Medical Pluralism

During the course of development of medical systems, several typologies have been created to deal with the classification of medical systems in medically pluralistic societies (*cf.* Dunn 1976; Glick 1977; Fabrega & Manning 1979; Islam 2016). Dunn (1976) classified medical systems into three categories based on geographic and cultural settings, namely the local medical system, regional medical system, and cosmopolitan medical system. The local medical system refers to the 'folk' or 'indigenous' system of a small-scale community in a state society. The regional medical system is distributed in a larger area such as Ayurvedic Medicine or Unani Medicine in South Asia. Lastly, the cosmopolitan medical system, also known as 'conventional

medicine' or 'biomedical system', is the global medical system. Dunn's classification has given major implications on the development of methodology for the analysis of medical systems in a pluralistic configuration (*cf.* Slikkerveer 1990).

In a medical anthropologist's seminal publication, Leslie (1980) characterised Asian countries as having a 'pluralistic medical system'. The need to define the plural character of medical systems demands a holistic approach to the study of the socio-cultural context of conventional and alternative medical systems. In this respect, Slikkerveer (1990, 2017) differentiates a social institution, including the medical system, as a traditional, transitional, and modern institution. In the context of a pluralistic medical system, Slikkerveer (2001) categorises a medical system as follows:

a. Traditional medical system based on the local perceptions, practices, and beliefs of a particular community;
b. Transitional medical system characterised by the economic and financial interest of drug vendors and provided by the intermediary personnel in developing countries;
c. Modern medical system as the official health care system which is based on Western science and technology and opposed to the traditional medical system.

This distinction has been used in several studies on transcultural health care utilisation in Tanzania, Greece, and Indonesia (*cf.* Ambaretnani 2012; Aiglsperger 2014; De Bekker 2020). In the same fashion, this research also follows the three distinctions of a medical system, namely the traditional, transitional, and modern medical system, which will be discussed separately in the next sections. From a conceptual point of view, this classification reflects a real-life available health service provider in the pluralistic context in Indonesia (*cf.* Ambaretnani 2012).

Medical pluralism is not a new concept for regions where there is a diffusion of cultural and social medical systems, such as in the Asian region. A study of the National Health Survey in Taiwan reveals that 32.5% of the population has reported the use of multiple healing systems including modern Western medicine, Traditional Chinese Medicine, as well as religious or spiritual healing (*cf.* Shih *et al.* 2010). In a recent publication, WHO states that medical pluralism is 'found in almost every country in the world' (WHO 2013, p 7).

The term medical pluralism[1] broadly refers to the practice and use of more than one medical or health care system (*cf.* Slikkerveer 1995; Baer 2008). Cant (2004) argues that medical pluralism is: '*the co-existence of different medical traditions grounded in different principles or based on different world views*'. Within this context, the concept not only refers to the co-existence of multiple health providers but also applies to the concept of health and illness, multiple categories of healers and health workers, and multiple choices between and within the system. In his study, Islam (2016) presents an extended meaning of medical pluralism which includes social perceptions about health and illness, the decision-making process in health-seeking behaviour, and the pluralistic response to resorting to different forms of healing. In the context of this study, medical pluralism refers to the utilisation of more than one medical system for health care or disease treatment. While this term is usually applied to health care systems, it is also used to describe individual choices with respect to health care approaches in the study context.

Charles Leslie (1980), a pioneer of medical anthropology, highlights the importance of studying medical pluralism as :*'fundamental comparative research on the pluralistic structures of a medical system would be an instrument of planning and also a technique for training personnel to design health development programmes in a realistic manner*'. Since Leslie's study on medical pluralism in Asia, the notion of 'medical system' has been widely used in the study of medical pluralism. Under the concept of medical pluralism, various studies have been conducted to explore the relationship between the modern medical system with the traditional medical system within the range of competence, co-existence, or cooperation. A study

conducted by Leslie (1977) in India reveals that indigenous medical practice seems to disappear and is replaced by the modern medical system. Likewise, a study conducted by Baer (2003) highlights the issue of the superior legal status of modern medicine over traditional medicine.

Johanssen (2006) indicates that the concept of pluralism has been employed in two basic ways. On the one hand, it glosses over the diversity *between* 'systems' in a community, region, or nation, where these differing systems compete with or complement each other. On the other, it describes the diversity *within* a broad system of medical practices, as exemplified in earlier work on Asian medicine traditions (e.g. Leslie 1975), wherein any medical system is intrinsically heterogeneous, and made up of people with diverse views and agendas. Medical pluralism exemplifies the importance of multiple options for health care to local people. It allows patients to seek specific aspects of these medical systems depending on their associations with the social and cultural beliefs of their specific illnesses. The plurality of medical systems enables them to switch from one type of health provider to another in order to get the best result. A study in India reveals that people adopt medical pluralism by perceiving them as a variety of options, not as a different system (*cf.* Bhasin 2007).

The concept of 'medical pluralism' has become more popular among scholars in applied health science, not only because of the resurgence of traditional, complementary and alternative medicine, but also due to the crisis in public health care which requires governments to change their health care policies (Penkala-Gawęcka & Rajtar, 2016). Several scholars argue that medical pluralism increased the range of therapeutic choices and complicated health-seeking behaviour (*cf.* Hardon *et al.* 2001; Kolling *et al.*, 2010). In his study on Plural Medical Systems in The Horn of Africa, Slikkerveer (1990) elaborates the practical advantages of the pluralistic perspective on medicine in developing countries. Firstly, it enables a more balanced appraisal to the simultaneous or serial use of health care which goes beyond the dichotomy of traditional or modern medicine. Secondly, medical pluralism provides a more objective interpretation of alternative medical systems which is sometimes interpreted as 'non-scientific'. Thirdly, it provides a better understanding on the study of health-seeking and utilisation behaviour. Finally, studies on medical pluralism have provided a challenge to the utilisation of medical systems within health care planning for developing countries. Within the perspective of a pluralistic medical system, the study of the cross-cultural comparison of medical systems has led to the ethnomedical approach which is distinct from the biomedical paradigm (*cf.* Slikkerveer 1990).

Regarding the relationship between various medical systems in different cultural areas or countries, several classification systems have been introduced. Although typological approaches may be at risk of over-simplifying the complexities of each medical system, the following paragraphs discuss each category of medical system employed in the present study, namely the traditional medical system, transitional medical system, and modern medical system.

2.2.1 Traditional Medical System (TM)

The concept of traditional medicine is a conventional term used by medical scientists to refer to the empirical medical system in different cultures all over the world. The terms 'traditional medical system', 'traditional system of health care', and 'traditional medicine' refer to long-standing indigenous systems of health care which are closely linked with the wider dimension of nature (*cf.* Bhasin 2007). Traditional medicine is the oldest form of healing practice in the world. Almost all communities around the globe have developed medical healing practices for cure and prevention of diseases as well as health promotion (Yuan *et al*., 2016).

In its widely acknowledged publication, WHO states that all countries in the South-East Asia Region have a heritage of traditional medical systems (*cf.* WHO 2003). The comprehensiveness of the term 'traditional medicine' and the wide range of its practices make

it difficult to be defined in a global context. Traditional medicine is defined by WHO (2012) as '*the sum of the total knowledge, skills, and practices based on the theories, beliefs, and experiences of indigenous different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness*'. Traditional medicine as an indigenous medical institution is defined as: '*local-level institutions with a socio-cultural and endogenous base, informal and sometimes invisible to the outsider, rooted in the history of the community and based on strong local philosophical principles of cooperation, mutual aid, and collective action, where the interests, resources and capacities of many community members are structurally joined together in order to achieve common goods and services for the entire community in a non-commercial way*' (*cf.* Slikkerveer 2019).

WHO reckons that a large number of people in the world still depend on traditional medicine for primary health care. In addition to traditional medical practices as defined by WHO, healing practices such as homeopathy, herbalism, and natural healing are gaining more popularity in Western Europe and the United States. In industrialised countries, those practices are labelled as Complementary and Alternative Medicine (CAM). Although in its official publication of Traditional Medicine Strategy, WHO tends to merge the concept of CAM with the concept of traditional medicine, the term itself is used to refer to:'*a broad set of health practices that are not part of a country's own tradition, or not integrated into its dominant health care system'* (*cf.* WHO 2002). Furthermore, Slikkerveer (2006 : 10) elaborates that CAM:*'refers basically to the integration of alternative therapies (herbal medicine, chiropractic, acupuncture, homeopathy, and massage), alternative professionals practising these disciplines, complementary self-help strategies, as well as alternative philosophies of health and healing such as energetics, spirituality and distance*'. However, in some countries, both terms, traditional and complementary medicine, are used interchangeably, generating the term Traditional/Complementary Alternative Medicine (T/CAM).

Several classifications have been attempted for defining traditional medicine. An essential feature of traditional medicine or traditional healing systems is based on cosmologies involving the physical dimension of health and illness, as well as the mental, social, spiritual, and ecological dimension. A fundamental concept of the traditional medical system in many systems is the balance between mind and body, individual and community, and individual and nature (*cf.* Bodeker 1996; Yuan *et al*., 2016). Other common key features of any traditional medical system are popular and public domain knowledge relating to self-help, religious dimension, social character, prevention-oriented approach, and holistic concept of health and illness (van der Geest, 1997) .

Types of traditional healing reflect cultural and social values. These values are part of long-term continuous knowledge, passed down from one generation to others. This tradition may include religious ideas, symbolic items, rituals, and plants. As per this context in which it is practiced or in the form of knowledge, traditional healing practice is often referred to in various ways such as traditional medicine, alternative medicine, natural medicine, herbal medicine, phytomedicine, non-conventional medicine[2], indigenous medicine, folk medicine, or ethno-medicine. Despite the fact that several scholars have attempted to classify and define traditional medicine, it is pointed out that there is no such homogenous body to put all medical knowledge and practices under one name (*cf.* Payyapallimana 2010). However, referring to those definitions, it can be concluded that the practice of CAM is outside the scope of indigenous healing practice.

The local use of medicine, although it is known by different terms, is broadly classified into three categories (*cf.* Hamilton 2005):

(1) Traditional Medicine System, with a systematic body of knowledge, such as Ayurvedic, Traditional Chinese Medicine, and Unani,
(2) Traditional Medical Knowledge or Folk Medicine, which is transmitted multigenerationally and orally from empirical use, and
(3) Spiritual medicine, with a strong spiritual element which can only be practiced by specialized local experts.

In this study, herbal medicine is examined as 'popular medicine.' This term is one of three classifications designated by Arthur Kleinman in his tripartite scheme of popular, folk, and professional medicine (*cf.* Kleinman 1980). This typology is based on who provides health care and in what context (e.g. home vs. institution). In the popular sector, care is 'based on shared cultural understandings and is provided by non-specialists, like one's self, one's mother, one's friends, or other kin and relations'. Along with diet, exercise, and a variety of commercially available and OTC products, herbs are deemed by Kleinman as popular medicine (*cf.* Baer *et al.* 1997).

Traditional medicine has been characterised as an 'open system' because of its capability to function in several institutional sectors (*cf.* Schucklenk & Ashcroft 2002). It is widely used in the prevention, diagnosis, and treatment of an extensive range of ailments. Traditional medicine is chosen for the health problems which cannot be adequately treated using western medicine (*cf.* Mander *et al*. 2008). There are numerous factors which lead to the increasing appeal of traditional medicine throughout the world, among which are that it is: more accessible, more affordable, more closely corresponding to the patient's ideology, and less paternalistic than allopathic medicine.

Stanifer *et al.* (2015) identify five major determinants in the use of traditional medicine, namely: health status, disease understanding, biomedical health care delivery, credibility of traditional practices, and strong cultural identities. In the same fashion, Kasole *et al.* (2019) point out that the utilisation of traditional medicine is influenced by cultural factors such as: tradition, belief, and cosmovision; supporting factors such as economic considerations and ease of access; external factors such as health promotions and promotion in the mass media; and morbidity factors. In Western industrialised countries such as Western Europe and the United States, the use of CAM such as homeopathy, herbalism, and natural healing has gained more popularity as the result of 'impersonal treatment', high cost of conventional medicine, and over-medicalisation (*cf.* Barnes *et al*. 2004; Slikkerveer 2006; Frass *et al.* 2012). The actual situation of the traditional medical system in the research area in West Java, Indonesia will be further discussed in Chapter V.

2.2.2 Transitional Medical System (TRM)

Early literature in medical anthropology reflects the general tendency to view medical systems in a dichotomous approach as either modern, biomedical, Western, and scientific, or non-Western and traditional. This dichotomous approach has hindered the study of medical practices which do not belong to both systems. When medical pluralism is viewed in the context of medicalisation, the pharmaceutical industry is implicated as a major contributor to the expansion of medical systems. Pharmaceutical industries provide options to address health care needs and consequently create a demand for health services and products (*cf.* Busfield 2010). Slikkerveer (1990) argues that the existence of pharmaceutical vendors and unofficial health service providers belong to unofficial systems of medical treatment which operate between traditional and modern medical systems. Consequently, to include those intermediate health service providers in the study of health utilisation behaviour, Slikkerveer (1982, 1990) introduces the concept of a transitional medical system which refers to the activities of pharmaceutical vendors in developing countries involving the commercial production and sale

of traditional and modern medicine. In particular, Slikkerveer (1990) emphasises that the economic and financial interests of the major pharmaceutical industries become the important consideration in a transitional medical system.

In her study, Aiglsperger (2014) adapts the concept of the transitional medical system as the commercially oriented sale of medicines in local institutions, such as medicine-dispensing outlets or pharmacies, through the assistance of intermediary health service providers. Following a similar concept, in his study in Tanzania, De Bekker (2020) characterises the transitional medical system as the crossover of traditional and modern medical systems with its special characterisation being the use of pharmaceuticals which are sold on a profit basis and not obtained through certified health workers. Treatments associated with the transitional medical system are not provided or suggested by doctors or professional health care. The intermediary of health service providers may fit with the definition of the folk sector which is described by Kleinman (1980) as a '*non-professional, non-bureaucratic, specialist sector*'. The folk sector is a mixture of many different components, some of which are closely related to the popular sector, such as home remedies, while others, such as pharmacists, are closely related to the professional sector. In this way, a transitional medical system provides the points of entrance and interaction between traditional and modern medical systems.

A mainstay component of a transitional medical system is the use of pharmaceuticals on the basis of self-medication; consequently, these topics should be studied in relation to each other. Self-medication is defined by the World Self Medication Industry (WSMI) as: '*the treatment of common health problems with medicine especially designed and labelled for use without medical supervision and approved as safe and effective for such use*' (WSMI 2009). In 1970, WSMI classified medicinal products into two classes, namely prescription and non-prescription or OTC medicine (wsmi.org). Officially, prescribed medicines can be obtained only if patients have the prescription from the registered physicians which are only distributed in hospitals and registered pharmacies. Conversely, OTC medicines can be obtained without prescription from physicians and are available through pharmacies, shops, and medicine-dispensing outlets. However, in many developing countries such as India, Indonesia, and Nigeria, prescription medicines are also commonly dispensed without valid prescriptions (*cf.* Kuku 2011; Brata 2016; Kumar 2016).

It is generally recognised that self-medication practices are expanding within the pharmaceutical industries in which access to their product is increased. The growth of this sector can be seen through the expansion self-medication facilities, such as herbal shops and OTC medicines and the expansion of alternative therapies, which are often referred to as 'commodification of health care' (*cf.* Stevenson *et al*. 2003).

Self-medication is one of the key contributors in providing people with easily accessible and affordable medicine in developing countries (*cf.* United Nations 2008). It has been part of family health care for many years, supported by the enthusiasm of industry, professions, and government (*cf.* Hughes *et al*. 2001). Studies in self-medication reveal that it is perceived to be convenient and often becomes the first step before seeking care from professional providers (*cf.* Stevenson *et al*. 2003; Shafie 2018). WHO (2000) states that: '*it has become widely accepted that self-medication has an important place in the health care system. Recognition of the responsibility of individuals for their own health and awareness that professional care for minor illness is often unnecessary has contributed to this view*'. Stevenson *et al.* (2003) observes that personal experience in successfully controlling minor illness gives people a sense of control over their own body and is viewed positively by respondents. Other studies report that modern consumers wish to take a greater role in the maintenance of their own health and are competent to manage minor illness and recurrent or long-term illness after being properly diagnosed by a doctor (WSMI 2009).

Self-medication is becoming an important component of the health care system both in developing and developed countries (*cf.* Bennadi 2014). Some countries are encouraging self-care for minor illness, particularly where the government covers the main cost of health services. Self-medication is seen as a way of saving health care costs (*cf.* Hughes *et al*. 2001; Galato *et al*. 2009). Self-medication is also important in the role of the prevention and treatment of chronic diseases, especially in developing countries where provision of health services is rather limited (*cf.* Hughes *et al*. 2001). This practice is recommended to be applied to many chronic diseases such as diabetes, asthma, and arthritis once diagnosis has been made by physicians (*cf.* WSMI 2009).

Self-medication, with the appropriate practice, can be beneficial in various aspects such as: direct and rapid accessibility, economical convenience, and promoting self-reliance in health care (*cf.* Shafie 2018). In its guideline on self-medication, WHO listed the benefits of self-medication, which include: (1) an active role in health care, (2) self-reliance in relieving minor symptoms, (3) education opportunities on specific health issues, (4) convenience and easy accessibility, and (5) reduced cost for medical consultation. On the other hand, self-medication also has potential risks including incorrect self-diagnosis, delay in seeking medical advice, increased polypharmacy, and being unaware of specific pharmacological risks (cf. Hughes *et al*. 2001; Bennadi 2014).

The availability of a wide variety of self-medication products coupled with easy access and lack of control from the government have been associated with irresponsible self-medication such as drug abuse and drug misuse (*cf.* Galato *et al.* 2009). In order for patients to be able to make appropriate decisions regarding their health, patients and their family must have adequate knowledge. Studies reveal that some people still have a lack of knowledge regarding how to consume medicines properly, the right indications, dosages and duration to take medicines, as well as their side effects (*cf.* Hughes *et al*. 2001). Only a minority of patients were able to diagnose their condition correctly based on a classic case scenario (*cf.* Henry *et al.* 2006). In his review, Hughes *et al*. (2001) conclude that in order to improve the effectiveness of self-medication, consumers need to be educated on rational drug use and pharmacists need to be pro-active in monitoring self-medication and providing advice to patients (*cf.* Hughes *et al*. 2001).

The nature and extent of self-medication varies in different cultural contexts and the social influence may be greater than the influence of medical practice. Several studies reveal that the practice of self-medication is largely influenced by an individual perception and belief in the effectiveness of the medicines (*cf.* Henry *et al*. 2006; Kuku 2011). Alamsdy (2011) reports that reasons for people to practice self-medication include delays in seeking assistance from medical practitioners, perceptions of people towards the severity of their illness, and insufficient money to cover medical consultation fees. Other factors also reported to influence self-medication include level of education, availability of medicines, and exposure to commercial advertisements (*cf.* Montastruc *et al*. 1993; Henry *et al*. 2006; Ruiz 2010)

Apart from pharmacy employees, the transitional medical system is moreover administered by a number of retailers or personnel. These healers or personnel are not representing the health care professional or traditional healers. They occupy an intermediate position between the traditional and modern health sector. The 'transitional' medical system is developed in the context of transitional societies, both due to the achievements, as well as the failure, of 'modern' medicine. As Slikkerveer (1990: 211) observes about those types of healers, they '*are often laymen with scant knowledge either of traditional or cosmopolitan medicine who sell pills, capsules, medicinal drinks and injections in shops or as they travel to markets throughout the country. Their practices are often illegal and contravene regulations concerning making up and dispensing prescriptions, but in many developing countries where facilities are scarce, it is virtually impossible to prohibit these being sold'.*

In view of the transitional medical system in the research area in West Java, Indonesia, the provision and patterns of utilization of the transitional medical system will be further discussed in Chapter V.

2.2.3 Modern Medical System (MM)

The modern medical system or modern medicine[3], also referred to with the term 'scientific', 'Western', or 'cosmopolitan' medical system, is the official health care system which is based on Western science and technology (*cf.* Lippincott & Wilkins 2006). Western medicine is typically associated with the biomedical model of health, in which Mischler (1989) outlines four characteristics of the biomedical model: (i) health is equated with the absence of disease; (ii) a single biological (pathological) agent is generally considered responsible for physiological disruption (i.e. the doctrine of specific aetiology); (iii) disease is considered universal and culturally non-specific; and (iv) scientific medicine (and those who practice it) is regarded as being objective and value-neutral.

The implication of the biomedical model is that there is practical significance placed on the disease, its cure, and the personnel that have the knowledge to provide treatment. A substantial body of research shows that conventional medicine is associated with illness as indicated by self-assessments of physical and mental health, acute and chronic conditions, and disability (*cf.* Votova 2012). Treatment in conventional medicine is often aimed at eradicating the disease, resulting in less involvement of the patient in the medical process (*cf.* Bloom 2002). A power imbalance in the doctor-patient relationship is a common feature of the conventional medical system.

Modern medicine or conventional medicine is the primary medical system worldwide. It has significant influence in several regions worldwide including Asian countries (*cf.* Bhasin 2007). The modern medical system is predominantly characterised by medical treatment which involves consultations with professional health care providers. Its services include those provided by auxiliary staff, nurses, medical and specialist doctors, and these services are delivered in offices, clinical or hospital settings.

In Indonesia, the first modern health service was introduced during the colonial period in 1626. The first hospital was established in Batavia with the main interest to maintain the health of the army and civil servants. After independence in 1945, the Indonesian Government began 'nationalising' some private hospitals (*cf.* Trisnantoro 2009). The realisation and actual situation of the modern medical system in Indonesia, specifically the research area, will be further described in Chapter V. The chapter will discuss the influence of modern medicine in the pattern of health care utilisation in the research area.

2.3 Studies of Patterns of Health Care Utilisation in Diabetes Treatment

2.3.1 Pathology and Treatment of Diabetes Mellitus

Diabetes mellitus is a chronic non-communicable disease (NCD) characterised by high blood glucose levels due to lack of insulin or the insulin not functioning to enable glucose to enter the cells. Previously, diabetes mellitus was believed to be a relatively distinct disease entity. Over the course of time, diabetes is often regarded as part of a broader underlying disorder characterised by a metabolic syndrome. This metabolic syndrome is a group metabolic disorder including glucose intolerance, impaired fasting glycaemia, dyslipidaemia, hypertension, central obesity, insulin resistance, and microalbuminuria (*cf.* Zimmet *et al*. 2005). It happens because most diabetes patients developed other conditions such as hypertension,

hyperlipidaemia, and obesity which contribute to the pathogenesis of cardiovascular disease (Baharvand-Ahmadi *et al*., 2016).

Type 2 diabetes mellitus is the most common type of diabetes and accounts for 90-95% of all diabetes cases. Diabetes mellitus is a prevalent condition with significant complications and serious consequences in many countries. There are multiple reasons for the increasing incidence of diabetes. Grant *et al.* (2013) argue that increasing awareness and recognition of the disease are accompanied by increasing western lifestyles and urbanisation, which lead to the development of metabolic disease.

Diabetes mellitus is a growing public health challenge globally. The United Nations deemed diabetes mellitus to be a chronic and costly disease placing a high burden not only on the individual but also the health care system. Although it is not curable, diabetes is a controllable NCD (Rasul *et al.*, 2019). Exercising and losing weight have been proven to reduce the complications of diabetes. Furthermore, increased public information about the symptoms, risk factors, treatment of the disease, and prevention strategies have been associated with improving patients' quality of life and reducing morbidity and mortality (Baharvand-Ahmadi *et al*., 2016).

In the practice and theory of public health in chronic disease, researchers shift their focus from the disease and cure to health and disease prevention, from the treatment of disease in hospitals to the management and monitoring of disease in the community (*cf.* Nettleton 2006). The specific goals of disease management programs may vary, but generally the programme is expected to provide patient support to prevent complications and improve patients' quality of life (*cf.* Benson 2010). The treatment of diabetes can be regarded as successful if the patients can achieve normal blood glucose levels by strictly adhering to daily treatment regimens. However, for many people with diabetes, it is difficult to adhere to lifestyle and behavioural changes to manage their diabetes condition (*cf.* Jones *et al.*).

According to the American Association of Diabetes Educators (AADE7), the needs of diabetes self-management are not only limited to adequate glycaemic control but also related to preventing complications. AADE7 listed seven essential self-care behaviours for diabetes patients which result in good outcomes: healthy diet, regular exercise, monitoring of blood sugar, compliancy with medications, good problem-solving skills, healthy coping skills and risk-reduction behaviours (*cf.* AADE7 2008). In this way, treatment of diabetes requires not only participation from the patient but also from health care providers. Support from the health care staff for maintaining a higher level of self-confidence of the patient to modified dietary habits and lifestyle all lead to successful behaviour changes (*cf.* Shrivastava *et al.* 2013; Jones *et al*. 2015).

According to Bergman *et al*. (2012), prevention of diabetes requires synergic strategies from the clinical sector and public health sector at the community level. On the one hand, the clinical sector plays an important role in the identification of risk status, providing recommendations for individuals at high risk for community-based lifestyle programs and patient counselling. On the other hand, the public health sector also has an important role in the treatment of diabetes including monitoring the risk of diabetes, initiating programs for diabetes prevention and assuring the quality of diabetes prevention programs. Additionally, the public health sector needs to evaluate the policies which facilitate healthy behaviour. In their analysis, Bergman *et al.* (2012) formulate the partnership model of the clinical and community public health sector (*cf*. Figure 2.1).

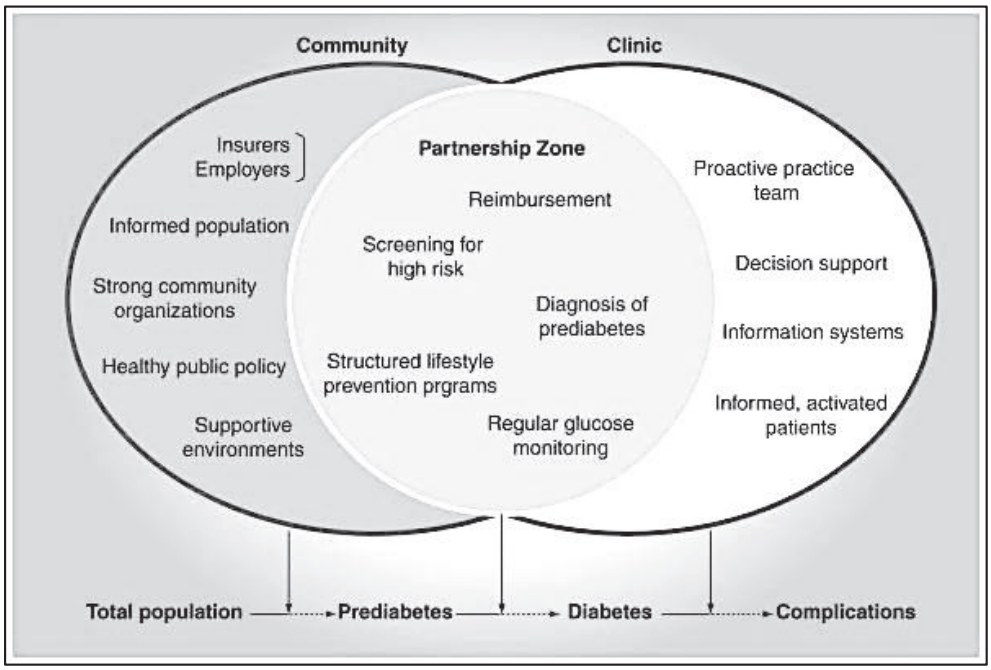

Figure 2.1 The Community Civic Partnership Model for the Prevention of T2DM
Source: Bergman *et al*. (2012)

In addition to the role of the clinical and public health sector, effective policies also make important contributions for diabetes prevention. Accordingly, there is an urgent need to translate the evidence-based study of prevention initiatives into a policy (*cf.* Siminerio & Mbanya 2011). As Bergman *et al.* (2012) conclude: '*…the three sectors, government, public health, and clinical, each have a critical role in this process and by working as a partnership, ought to create the necessary synergies essential for making substantial forays in the prevention of diabetes*'.

However, despite its comprehensiveness and validity, international guidelines in the treatment of diabetes may not be appropriate in regions such as Asia, Africa, or Latin America. Those regions have different cultural conditions, socio-economic status, epidemiology, and phenotypes from Europe and America (cf. Mohan *et al*. 2020). Although pharmacological therapy remains the primary intervention form in the treatment of diabetes mellitus, limited accessibility and cost become limiting factors for optimal care.

Both in developed and developing countries, cost is an integral part in the treatment of the disease (*cf.* Mohan *et al.* 2020). Consequently, treatment of diabetes in resource-restricted settings has to consider access, cost for treatment, and insurance coverage. Additionally, Bouwari (2012) suggests that education should be a high priority intervention for the prevention of diabetes in developing countries. As Grant (2013) concludes, patients' education is one of the least expensive diabetes treatments and presents an effective part of the diabetes care-delivery programs. In this way, diabetes treatment in developing countries could be better targeted with community-based studies of primary prevention, establishing lifestyle intervention, and lowering the cost of antidiabetic agents (*cf.* Narayan *et al*. 2006).

2.3.2 Health Care Utilisation in the Treatment of Diabetes Mellitus

Diabetes mellitus, as a chronic illness, has become the major cause of morbidity worldwide (*cf.* WHO 2014). One approach to the treatment and prevention of diabetes mellitus is to examine the health-seeking behaviour and patterns of health care utilisation behaviour in the target community. Tripp-Reimer *et al*. (2001) observe that the need to involve cultural factors, such as health and illness beliefs, in the treatment of diabetes has been identified in past decades. Although diabetes has just recently been identified as an illness in many ethnic groups, some communities have shown various beliefs about diabetes with broader cultural health/illness belief systems. Diabetes is often believed to be caused by excessive consumption of sugar, stressful conditions, and improper behaviour (*cf.* Tripp-Reimer *et al*. 2001). For example, Native American tribes believe that diabetes is the result of consuming too much food, drinking alcohol, or behaving immorally, while some people in Sri Lanka and Thailand view diabetes as pertaining to bad deeds (*karma*) (*cf.* Tom-Orme 1993). As a result, diabetes may be perceived as a shameful disease because it shows failure to live properly. Mann *et al.* (2009) report that misconceptions about the illness are identified as the most important determinants for health-seeking behaviour in chronic illness patients and could hinder optimal treatment of disease.

A study on health care utilisation among diabetes patients in Bangladesh reveals that utilization of health care services for diabetes in urban areas is affected by the socio-demography and socio-economic status of the patients, such as residence, gender, age, level of education, occupation and income. Literacy levels, knowledge and perceptions of the disease also influence utilization of services for diabetes (*cf.* Siddique *et al.* 2017).

People with diabetes may use ethnomedicine parallels with biomedicine. The coexistence of these forms of medicine suggest movement towards medical pluralism. Several studies in Africa reveal that people with diabetes contact pluralistic medical care. Anthropological research suggests that medical pluralism is a key feature in chronic disease experience (Kolling *et al.* 2010; Meta *et al.* 2015; Atwine & Katarina 2016).

Major social and health factors identified as important determinants of health care utilisation in previous studies are age, gender, socio-economic status, immigration status, chronic condition, and perceived health status. Earlier, Slikkerveer (2006) argued that the economic status of the patients becomes a decisive factor in the choice of health service. Studies show that socio-economic status has been found to be a determinant in people's response to the utilisation of health care services and the continuation of the treatment of chronic diseases.

The opportunity to use health services is also seen as being enabled by individual and area level factors. For instance, having a regular source of care, having health insurance, or living in a rural environment where health services tend to be less abundant enable or constrain health care utilisation. In most developing countries, distance to health care service plays a significant role in determining utilisation of health services (*cf.* Buor *et al*. 2003; Awoyemi *et al.* 2011). However, once health needs are taken into consideration, they are often found to be a dominant, if not *the* dominant factor predicting use of health care (*cf.* Andersen, 1995).

2.3.3 Transcultural Perspective on Health Care Utilisation

As previously discussed, health care utilisation has relied heavily on theories and models which are commonly used to understand health behaviour, health-seeking behaviour, and utilisation. It is not always easy to tell the factors which play a major role when one makes a decision to use health care. Factors thought to influence the decision to use health care services include culture, perceptions, access, economics, knowledge, age, gender roles and beliefs in efficacy

among others. Several models and theories have been used to study health care utilization. McKinlay (1972) listed these models under the following key approaches, namely the economic approach, the socio-demographic approach, and the socio-psychological approach. In the economic approach, help-seeking is viewed as a rational weighing of costs and benefits by individuals. Key factors in this approach are the cost of the health service, income, and health insurance. The socio-demographic approach views the utilisation of a health service as influenced by demographic variables such as age, gender, education, and social class. The last approach, the socio-psychological, focuses on utilisation behaviour with respect to beliefs, norms, motivation, and intention of individuals using health services. Remarkably, those approaches are not mutually exclusive and a certain degree of overlapping may be found in each other.

These models and theoretical approaches have given different views and information on why some individuals may or may not utilize health care services effectively. While many studies on patterns of health care utilisation mainly focussed on the single medical system, in developing countries, studies on health utilisation had to address the plural medical systems in order to provide a better understanding of the realistic situation in health care behaviour. A specific approach is needed to analyse the patterns of utilisation of co-existing medical systems within society. In light of medical pluralism, Slikkerveer (1990) operationalised the concept of medical pluralism using the transcultural approach towards the use of several medical systems.

The transcultural approach model consists of sets of categories which are: the predisposing factors, enabling factors, perceived morbidity factors, institutional environmental factors, intervening factors and factors of health care utilisation; these are measured at the individual and system level. This model can be applied to different countries and the variables can be adapted to be contextually relevant. This model also recognises the importance of social and cultural variables which is relevant for understanding health care utilisation in Indonesia. As Slikkerveer (1990) argues: '[The model of transcultural health care utilisation] *not only elucidates the complex illness behaviour within a pluralistic medical configuration but also ascertains causes of differential and under-utilisation of particular medical resources'*. This transcultural approach model which is used in the study will be further discussed in Chapter III.

2.4 Indigenous Knowledge Systems and the Ethnosystems' Approach

Slikkerveer (1995) defines indigenous knowledge as:'*a specific system of knowledge and practice, developed and accumulated over generations and as such unique to a specific culture and region*'. Furthermore, Lewinski (2004) adds that: *'indigenous knowledge encompasses indigenous names, designations, and folklore*'. Supporting these views, Fien (2006) elaborates that indigenous knowledge is: '*the local knowledge that is unique to a culture or society. Other names for it include local knowledge, folk knowledge, people's knowledge, traditional wisdom or traditional science. This knowledge is passed from generation to generation, usually by word of mouth and cultural rituals, and has been the basis for agriculture, food preparation, health care, education, conservation and the wide range of other activities that sustain societies in many parts of the world*'.

In the present study, the term 'indigenous' is interchangeable with the term 'traditional' in which, in a wider context, the specific system for describing this particular knowledge and practice is an Indigenous Knowledge System (IKS). The special characteristic of indigenous knowledge is that the knowledge is maintained through oral transmission, embedded in culture, and encoded in language. Indigenous Knowledge is often dismissed and perceived incapable of adapting to the modern world. As a result, IKS have not been studied in a systematic way and are facing extinction (*cf.* Rist & Dahdouh-Guebas 2005).

In order to further functionalise indigenous knowledge into practice, Slikkerveer (1999) proposed a methodological approach integrating culture and development by identifying determinants in people's utilisation behaviour in a given ethnic group or community. The methodology is known as the 'Ethnosystems' Approach'. An ethnosystem is defined as: '*sets of conceptions and practices which are specific to an ethnic group and generally localized in rural peripheries, as opposed to centralized urban systems often origination in modern societies*' (Slikkerveer 1989). Moreover, Slikkerveer & Dechering (1995) explain that an ethnosystem is the opposite of a cosmopolitan system. It is culture-specific and roots in one's long-term experiences which provides a sound basis for establishing patterns of particular behaviour in the community, such as medicine, agriculture, education, language and society structures (*cf.* Aiglsperger 2014).

The ethnosystem approach which includes cognitive and behavioural aspects has broadened the earlier perspective of IKS. Slikkerveer (2019) elaborates: *'The extended conceptualisation of indigenous knowledge includes not only the reference to local knowledge and practice but also perceptions, beliefs, cosmologies, values, wisdom, experience and last but not least institutions which have developed over many generations in a particular field of ethnographic study*'. This approach allows assessment of IKS in a holistic manner, including the historical process, interaction between the ethnosystem and cosmopolitan system, as well as the socio-economic development process. Furthermore, the ethnosystem approach in the study of IKS adopts a bottom-up approach, which is based on the participation of local people and prompts researchers to adopt an *emic* perspective instead of an *etic* perspective (*cf.* Slikkerveer & Dechering 1995; Slikkerveer 1999; Slikkerveer 2003).

The ethnosystem approach has been proven as a viable tool for sustainable development in the region at the level of economic sustainability and self-reliance. It has significantly contributed to a general understanding of various forms of medical treatment, health care delivery improvement, knowledge recovery and conservation, plant documentation and classification, and environmental conservation (*cf.* Balick 1994). The ethnosystem approach is being increasingly used to assist policymaking in many sectors including food and agriculture, conservation of biological diversity, health, communication, and economic development (*cf.* Slikkerveer 1990; Agung 2005; Ibui 2007; Leurs 2010; Djen Amar 2010; Ambaretnani 2012; Chirangi 2013; Aiglsperger 2014; Erwina 2019; Saefullah 2019; De Bekker 2020).

Furthermore, the study of IKS has further been specialized to people's knowledge of the natural environment which generate Ethnobotanical Knowledge Systems (EKS) as specific forms of IKS (cf. Balick & Cox 1996; Slikkerveer 1995; 1999). It becomes almost impossible to discuss health sector reform strategies in a traditional medical system without considering the EKS of the specific population. While ethnobotany refers to the study of the relationship between local people and their indigenous MAC plants in terms of their knowledge, practices and behaviour, the concept of EKS focuses on the interaction between local and global knowledge systems of these MAC plants (*cf.* Slikkerveer 2000).

2.4.1 The Field of Ethnoscience: Ethnobotany and Ethnomedicine

Studies on IKS have been conducted within the field of *ethnoscience*. The so-called neo-ethnography or ethnoscience is first introduced in the mid-twentieth century, in which culture is no longer considered as collections of artefacts but as systems of knowledge or mental aptitudes (*cf.* Brown 1999). According to Atran (1991), ethnoscience views culture in a scientific perspective and provides better understanding of how people develop different knowledge and beliefs. Ethnoscience has come to face 'traditional knowledge' not only as a research subject but also as a legitimate body of knowledge (*cf.* Alves & Albuquerque 2010). Ethnoscience is a trans-disciplinary field of science consisting of collaboration among social science, humanities, and natural science. In the literature, terminology such as ethnobotany,

ethnoecology, and other sciences with the prefix *ethno-* are sometimes replaced by terms which qualify the knowledge characteristics of a given population such as local, indigenous, folk, native, or culturally specific knowledge. Martin (2004) elaborates that the prefix *ethno-* is added in order to highlight the focus on indigenous people's knowledge in various disciplines. Ethnoscience is often referred to as a specialisation of IKS such as ethnobotany, ethnomedicine, ethnoecology, etc. (*cf.* Atran 1991).

Ethnobotany is the science which studies the relationship of one ethnic group or community with its environment, in particular plants. Ethnobotany as a research field has been widely used for the documentation of indigenous knowledge on vegetation and forest management, medicinal plants, agriculture and biodiversity. The current framework of study in the field of ethnobotany enrols different disciplines and skills including botanists, anthropologists, pharmacologists, molecular biologists, and health care practitioners (*cf.* Balick & Cox 1999).

Ethno-directed sampling of indigenous plant collections on the basis of the indigenous knowledge and practices of local people has shown a greater proportion of useful plants (*cf.* Farnsworth 1993; Cox & Balick 1994; Sheng-Ji 2001). In recent years, the study of ethnobotany has become increasingly associated with the search for herbal medicine and phytoconstituents in drug developments (*cf.* Balick & Cox 1999). Slikkerveer (2003) argues that an ethno-directed approach in the study of medicinal plants is less costly and culturally appropriate as it advocates an analysis of medicinal plants based on the recommendation of local healers or local people.

Along with increased interest in herbal medicines, interest in the field of ethnobotany, ethnomedicine, and ethnopharmacology is increasing as well. As an interdisciplinary field of science, ethnobotany contributes to preserving the wealth of traditional medical knowledge. Ethnobotany and ethnomedical studies can contribute greatly to modern medicine and are considered the most effective methods in the discovery of new medicines (*cf.* Mahwasane *et al*. 2013). Ethnobotanical information on medicinal plants is often used to guide the selection of plants for new drug development. The identification of biologically active compounds needs to be interpreted in light of the traditional use and preparation of the plant (*cf*. Holmstedt & Bruhn, 1995). It should comprise a chemical and pharmacological evaluation of the traditional drug preparation in order to establish dose-effect relationships for the quantitative use of the remedy.

Numerous ethnobotanical studies have been conducted to identify new plant-derived pharmaceutical products. Ethnobotanical information on medicinal plants by the local community is not only useful for local community health care but also guides phytochemical and pharmacological screening of new drug developments (*cf.* Sheng-Ji 2001). Studies indicate that pharmacological screening of plants based on use by the local people results in a higher percentage of pharmacologically active components compared to random sampling (*cf.* Lewis & Elvin-Lewis 1995; Slikkerveer 2006). Sheng-Ji (2001) reports that during the 1980s, more than twenty new medicines were developed based on ethno-directed approaches. Hence, the use of traditional knowledge of medicinal plants renders ethnobotanical research as promising and contributive to techniques in the development of new plant-based medicine (*cf.* Farnsworth 1993; Cox & Balick 1994; Sheng-Ji 2001). Furthermore, studies on the medicinal properties of plants have recently focused on scientific evaluation in the search for new medicines within the study field of ethnopharmacology. This field focuses on the study of the medicinal use of plants by indigenous cultures, and to scientifically validate their effects and side effects (*cf.* Farnsworth 1993).

In the early twentieth century, focus on the study of ethnobotany and ethnopharmacology shifted from the plant's inventories to the role of plants in the community (*cf.* Schmidt & Cheng 2017). Studies on traditional healing practices by local communities gained a revitalization and were conducted within the field of ethnomedicine. Studies on ethnomedicine largely focus on

indigenous medical knowledge, beliefs and practices with regards to health and illness in one community. In ethnomedical studies, the utilization of medicinal plants has been identified as a major component of medical treatment across different communities. Consequently, the study of indigenous concepts of health and healing generally employs a combination of the ethnobotanical and ethnomedical approach (*cf.* Slikkerveer 2006).

2.4.2 Medicinal, Aromatic, and Cosmetic (MAC) Plants for Diabetes Mellitus

Medicinal plants are gaining wider recognition at the global level for their conservation and development. WHO defines medicinal plants as a form of traditional medicine composed of indigenous beliefs and practices designed to maintain the health of individuals by treatment, prevention, and diagnosis (*cf.* WHO 2008). Slikkerveer (2003) has pointed out that the extensive volume of plants used not only for medicinal but also cosmetic purposes initiated the extension of Medicinal and Aromatic plants by adding a category of plants with cosmetic uses. This phenomenon is comparable with the use of *jamu* in Indonesia, where the use of plants for health and beauty has been a major part of the cultural heritage in the country. This situation has emphasized the practical need to extend the categorization of medicinal and aromatic plants into medicinal, aromatic, and cosmetic (MAC) plants [4] (*cf.* Slikkerveer 2003).

MAC plants have indeed played a significant role in the development of effective new drugs. In this way, modern medicine has benefitted considerably from traditional medicine and the use of MAC plants. As a successful example of drug development from natural products is artemisinin and its analogues which are isolated from *Artemiasia annua* and currently used for antimalaria treatment (Yuan *et al*., 2016). In the period 1940-2002, 54% of recently approved anticancer drugs were derived from medicinal plants. The use of medicinal plants is increasingly finding relevance especially with the recognition that, as indicated earlier, many medicines currently in use such as aspirin, codeine, ipecac, etc. (*cf.* Table 2.1) are derived from MAC plants.

Table 2.1 Drugs Discovered Based on Ethnomedicine

Generic name	**Origin**
Aspirin	*Filipendula ulmaria*
Codeine	*Papaver somniferum*
Ipecac	*Psychotria ipecacuanha*
Pilocarpine	*Pilocarpus jaborandi*
Pseudoephedrine	*Ephedra sinica*
Quinine	*Chinchona pubescens*
Reserpine	*Rauvolfia serpentina*
Scopolamine	*Datura stramonium*
Theophylline	*Camellia sinensis*
Vinblastine	*Catharantus roseus*

Source: Cox & Balick 1994

In the case of diabetes mellitus, WHO has recommended the use of medicinal plants and herbal medicine to treat diabetes and its complications. Research and development of herbal medicines for specific chronic diseases should follow the same approaches as in the case of 'folklore' medicines. Many herbs and spices are claimed to have blood glucose-lowering effects and are useful for the treatment of diabetes. It is estimated that more than 1,200 plant species are used traditionally as antidiabetics (*cf.* Marles & Farnsworth 1995). To date, a vast number of plants have been evaluated for their antidiabetic properties. The antidiabetic

activities of some MAC plants are attributed to the presence of phytoconstituents including glycosides, alkaloids, terpenoids, and flavonoids (Malviya *et al*., 2010).

There are several fundamental modes of action of phytoconstituents in regulating blood glucose in the diabetes condition. The principle mechanisms include stimulating insulin secretion, augmenting peroxisome proliferator-activated receptors (PPARs), inhibiting α-amylase or α-glucosidase, inhibiting the secretion of incretin, GLP-1, inhibiting advance glycation end-product (AGE) formation, free radical scavenging and antioxidant activity against ROS/RNS, upregulating translocation of glucose transporter type-4 (GLUT-4), and preventing development of insulin resistance (*cf.* Nazarian-Samani *et al.* 2018).

The list of MAC plants for the treatment of diabetes mellitus, particularly found and used in West Java Indonesia, will be further discussed in Chapter VI.

Notes :

1. Oxford online dictionaries define 'Pluralism' as :'*a theory or system that recognise more than one ultimate principle*'.
2. The term cosmopolitan medicine, which is deeply discussed by Leslie (1976) and Dunn (1976), will be used contextual with the same definition with western medicine, biomedicine, modern medicine, or scientific medicine.
3. At the present study, any form of medical treatment which is offered by modern health care providers at modern health care facilities is referred to modern medicine.
4. Referring to the extended categorization, the discussion of ethnobotanical study on medicinal plants also refer to the aromatic and cosmetic plants, hereafter will use the terminology MAC plants.