AFRICAN TRADITIONAL PLANT KNOWLEDGE TODAY: An ethnobotanical study of the Digo at the Kenya Coast

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DECLARATION

This dissertation is the result of original research conducted by myself with the guidance of my supervisors Prof. Dr. Erwin Beck and Prof. Dr. Franz Rottland. Any reference to other sources has been acknowledged in the text.

No part of this work has been submitted for a degree at any other University.

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Traditionelles Pflanzenwissen im heutigen Afrika: Eine ethnobotanische Studie der Digo an der Kenianischen Küste

Zusammenfassung

Das Volk der Digo ist eine von neun Untergruppen der **Midzichenda** (amtliche Schreibweise **Mijikenda**), die im südlichen Teil der kenianischen Küste leben und dort "heilige Wälder", sog. **Kaya** als Schutzgebiete bewahren. Ursprünglich bezog sich der Begriff Kaya auf eine befestigte und bewohnte Lichtung im Wald, aber heute ist damit der Wald selbst gemeint. Es handelt sich um Reste des früheren Küstenwaldes, die immer noch spirituelle Bedeutung für die Midzichenda haben. Das Fortbestehen der Kaya-Wälder hat dazugeführt, dass nicht nur die Pflanzen, sondern auch traditionelles Pflanzenwissen und damit verbundene Glaubensvorstellungen erhalten geblieben sind. Da die Digo sich als erste von den übrigen Midzichenda-Gruppen getrennt haben, kann angenommen werden, dass das ursprüngliche Pflanzenwissen sich bei ihnen stärker und reiner erhalten hat. Andererseits dringt auch die Botanik als Wissenschaft über den Schulunterricht und die landwirtschaftliche Beratung in die Digo-Gesellschaft ein. Da beide Wissenssphären unterschiedliche Strukturen und Schwerpunkte haben, existieren sozusagen zwei Systeme von Pflanzenwissen gleichzeitig und parallel, erstaunlicherweise ohne dass es dadurch zu ernsten Konflikten kommt.

Ziel der vorliegenden Studie ist die Dokumentation des "traditionellen" Pflanzenwissens der Digo mit den darauf bezogenen Vorstellungen und Praktiken. Zugleich sollte die Wirkung globaler Einflüsse (vor allem der wissenschaftlichen Botanik) auf das Pflanzenwissen der Digo untersucht werden. Mit diesem Ziel hat der Verfasser, der selbst ein Digo ist und in dieser Gesellschaft aufwuchs, seine persönlichen Erfahrungen vor dem Hintergrund seines im Studium der Botanik erworbenen Pflanzenwissens gesichtet und mit linguistischen und ethnologischen Grundbegriffen angereichert und analysiert. So gerüstet hat er versucht, das eher verborgene Wissen der Digo ans Licht zu bringen. Zahlreiche traditionelle Nutzer von Pflanzen - Heiler, Bauern, Holzfäller, Zimmerleute, Hausbauer, Gemüse- und Pilzsammler - wurden befragt und beobachtet. Dasselbe geschah mit den "Fortschrittlichen" - Lehrern, Studenten und Schülern. Aus den Antworten, ihren Begründungen und dem beobachteten nicht verbalisierten Umgang mit Pflanzen wurde sowohl tradiertes Wissen freigelegt als auch der Einfluss der wissenschaftlichen Botanik festgestellt. Vorsichtige Prognosen über die künftige Entwicklung des Pflanzenwissens der Digo wurden daraus abgeleitet.

Die **Kaya Elders** stehen im Ruf, die Bewahrer des kulturellen Wissens der Digo zu sein; deshalb stand am Anfang der Untersuchungen die Vermutung, dass sie wegen ihres umfassenden Wissens die bevorzugten Gesprächspartner sein würden. Es zeigte sich aber, dass auch die Kaya Elders nur Pflanzenwissen in den Bereichen ihres jeweiligen Alltags besitzen, also im Feldbau, als Heiler etc. Diese völlig unerwartete Beobachtung zeigt einen Rückgang der Kultur-bewahrenden Funktion der Elders zu Gunsten ökonomisch bestimmter Lebensstrategien. Die Konsequenz ist, dass man nur Digo-Gruppen mit partiellem, auf spezifischen Nutzen ausgerichtetem Wissen findet. Daraus ergab sich die Notwendigkeit, möglichst viele verschiedene Nutzer von Pflanzen zu befragen - ein Umstand, der von manchen Ethnobotanikern übersehen wird.

Das Pflanzenwissen der Digo - untrennbar vom täglichen Leben der Menschen - bietet ein riesiges Beobachtungsfeld. Die vorliegende Studie kann deshalb auch nicht erschöpfend sein, geht aber ihr Ziel der Dokumentation und Illustration des tradierten Wissens durchaus gründlich an; im Einzelnen wurden folgende Aspekte genauer untersucht.

- Lexikon der Pflanzen und Pflanzenteile
- nicht-verbalisiertes Pflanzenwissen
- Gliederung der Pflanzenwelt
- kognitives Erfassen der "unsichtbaren" botanischen Prozesse
- praktische Anwendung des Pflanzenwissens beim Feldbau
- lokale und globale Komponenten des Pflanzenwissens

Als Fazit kann vorausgeschickt werden, dass das pflanzenbezogene Wissen der Digo im angewandten Bereich sehr extensiv ist, dass es andererseits lückenhaft ist, wo Wissen nicht zur Anwendung gebracht werden kann und es unerheblich ist, ob man etwas über eine Pflanze weiß oder nicht. Mit anderen Worten: Das praxis-bezogene Pflanzenwissen der Digo zielt überhaupt nicht auf Vollständigkeit oder Kohärenz, ist also kein wissenschaftliches Wissen. Der globale Einfluss der wissenschaftlichen Botanik auf das Wissen der Digo ist eher peripherer Natur und im Wesentlichen auf Terminologie und nicht auf Sachkenntnis ausgerichtet. Wenn tradiertes Pflanzenwissen der Digo verebbt, dann nicht wegen des Eindringens der globalen Pflanzenwissenschaften, sondern weil im Zuge der Urbanisierung und Subsistenzwirtschaft durch Handel und in der Tourismusbranche die Bedeutung des Pflanzenbaus und der Landwirtschaft nachlässt.

Die verschiedenen Aspekte der Studie sind als Kapitelfolge in fortschreitender Komplexität des Wissens dargestellt und führen von der einfachen Terminologie zur "Erklärung" und schließlich zum Ausblick auf die künftige Entwicklung. Im Folgenden werden die einzelnen Kapitel der Reihe nach zusammengefasst.

Terminologie und Beschreibung von Pflanzen

Das Pflanzenwissen der Digo ist in hohem Maße lexikalisiert; es enthält ca. 80 Bezeichnungen für Pflanzenteile, etwa 20 beschreibende Termini für Pflanzen und mehr als 500 Pflanzennamen. Auch findet man nicht-verbales Wissen, z.B. die Kenntnis unbezeichneter Blütenteile, und unterspezifizierte Eigenschaften wie Farbe, Geruch und Geschmack. Einiges davon wird kognitiv erfasst, während anderes für die Digo ohne Belang zu sein scheint. Man geht also selektiv vor und lässt sich von seinen materiellen und sozialen Interessen leiten. Vollständigkeit des Wissens, wie in der wissenschaftlichen Botanik, ist außerhalb der Interessenssphäre.

Die Digo-Terminologie deckt sich vielfach nicht mit der wissenschaftlichen Terminologie und sie ist auch nicht ohne weiteres in andere Sprachen übersetzbar. Es gibt Teiläquivalente wie *Makodza*: Blätter, *Ruwa* : Blüten, *Tunda* : Frucht, oder *Muzi* : Wurzel, aber die jeweils durch diese Begriffe abgedeckten semantischen Felder sind zwischen den Sprachen nicht deckungsgleich.

Die Digo-Pflanzenterminologie zeigt starke Anleihen bei der Fauna (Mensch und Tier), vermutlich weil letztere stärker erfahren wird. So werden Körperteilbezeichnungen auf Pflanzenteile übertragen: *Nyama* (Fleisch), *Mromo* (Mund), *Dzitso* (Auge), *Mongo* (Rückgrat), *Mishipa* (Adern) und *Mala* (Finger). Andererseits werden Bezeichnungen für Pflanzenteile wörtlich oder metaphorisch auf Menschliches übertragen, z.B. *Gopha* (Rinde), *Sina* (Stamm), *Mbeyu* (Samen).

Das Pflanzenlexikon der Digo hat ererbte (historisch ableitbare) Wörter und Innovationen für neu erfasste Elemente. Zu letzterem dienen auch Lehnwörter, vor allem aus dem Swahili. Die Digo gehen also aktiv mit ihrem botanischen Vokabular und seiner Anpassung um. Dies war auch während der Feldforschung zu beobachten. Benennung und Beschreibung sind vor allem am Nutzen orientiert, d.h. der Grad der lexikalischen Detailliertheit entspricht dem Grad der Nützlichkeit. Das gibt vor allem den Nutzpflanzen eine besondere Stellung in der

Terminologie (an der Kokospalme dargestellt). Auch ist eine gewisse, vom kulturellen Kontext abhängige Polysemie erkennbar, wobei z.B. das gleiche Wort gewöhnlich "Blüte" bedeutet, aber in einem anderen Kontext auch für "Blatt" steht.

Traditionelle Pflanzenbestimmung

Nach dem schon dargestellten Nutzenprinzip erkennen die Digo vor allem die von ihnen genutzten Pflanzen und heben deren nützliche Teile hervor. Die Identifizierung von Pflanzen im Terrain ist wenig verbalisiert, sondern beruht auf einer Vertrautheit, die nicht mehr bewusst erworben oder gar abgeleitet wird. Die Lokalität des Vorkommens spielt dabei eine wichtige Rolle. Entsprechend langwierig ist der Identifikationsprozess in unvertrautem Gelände, wo Ableitungs- und Analogieverfahren eingesetzt werden müssen.

Die unterschiedlichen Interessen der Nutzergruppen haben zu unterschiedlichen Identifikationsverfahren geführt. Holzverarbeiter haben sehr detaillierte Möglichkeiten der Unterscheidungen von Holzarten und -qualitäten wie Farbe, Geruch und Maserung. Diese Kenntnisse beschränken sich aber auf die benutzten Hölzer. Heiler unterscheiden (verbal oder nicht-verbal) vielen Pflanzenteile - auch Wurzel - die im allgemeinen sonst kaum Interesse finden. Gemüse- und Pilzsammler sind am "Essbaren" und dessen Kennzeichen interessiert und beachten die übrige Pflanzenwelt nicht.

Unter den Pflanzenteilen, die zur Identifikation benutzt werden, stehen die Blätter an erster Stelle und erhalten folglich auch die größte Detaillierung. Hier kommt das Digo einer wissenschaftlichen Beschreibung am nächsten, während die Blüten weitestgehend vernachlässigt werden. Die Auswahl des zu Beschreibenden ist auch hier ausschließlich am Nutzen orientiert und lässt so einen beträchtlichen Teil der Pflanzenwelt außer Acht.

Pflanzennamen und Benennungsstrategien

Die Pflanzennamen des Digo bestehen aus Wörtern und Satzteilen, die zur weiteren Differenzierung die phonologischen und morphologischen Mittel der Sprache einsetzen. So können die verschiedenen Entwicklungsstadien einer Pflanze durch die Wahl des entsprechenden Präfixes (z.B. Diminutivpräfix) dargestellt werden. Einige Pflanzen haben zusätzliche - auf Feminines verweisende - Nasalpräfixe, die das grundsätzliche Verständnis der Digo verdeutlichen, dass Pflanzen (wie alles was biologisch produziert) weiblich sind.

Lexikalisch unmarkierte Pflanzenbezeichnungen verweisen unausgesprochen auf Weibliches, während "männliche" Pflanzen, die als nutzlos, weil nicht produzierend, eingeschätzt werden, mit dem Zusatz *Mlume* (männlich) markiert werden.

In einem Korpus von 390 Pflanzennamen sind ca 40 % nicht semantisch analysierbar. Die meisten davon sind ererbte Termini mit weiter Verbreitung im Midzichenda und finden sich auch bei den Duruma und Giriama. Die analysierbaren Pflanzennamen scheinen nach den folgenden kognitiven Kriterien gebildet.

- Nützlichkeit, besonders bei Pflanzen mit magischer Funktion
- Habitat, u.a. *Tsaka* (Wald), *Koma* (Wildnis), *Bara* (Hinterland), *Pwani* (Meeresnähe), *Ziya* (See), *Munda* (Ackerland)
- Verweis auf tierische Merkmale
- Physische Eigenschaften wie Geruch, Farbe, Geschmack und Größe der Pflanze oder einzelner Pflanzenteile
- Eigenschaften des Wuchses (z.B. parasitisch und epiphytisch)

Auch hier gehen die Namen auf verschiedene historische Stufen der Sprachentwicklung zurück. Je nach dem "Knoten" im linguistischen Stammbaum, auf den ein Name zurückgeführt werden kann, kann man Altersstufen zwischen mehr als tausend und weniger als hundert Jahren ansetzen. Interessanterweise beschränken sich auch lexikalische Innovationen auf den ursprünglichen kleinen Satz an Merkmalstermini, also die "primären" Farbtermini *nyiru* (schwarz), *nyereru* (weiß) und *kundu* (rot), den Geruchsterminus *nuuk* (stinkend) und den Geschmacksterminus *utsungu* (bitter).

Digo-Taxonomie

Die Merkmale in der Volkstaxonomie im Digo sind nur entfernt vergleichbar mit denen der wissenschaftlichen Taxonomie. Auch ist die Digo Taxonomie nicht annähernd so umfassend wie die von Berlin (1992) und anderen Ethnographen vorgestellten mittelamerikanischen Taxonomien, entspricht aber der bei Kakudidi (2004) angegebenen geringen Tiefe. Es gibt im Digo keinen „UNIQUE BEGINNER“, d.h. keinen Typ "Pflanze", weshalb Pflanze auch keine klassifikatorische Ebene im Digo ist. Die deutlichsten klassifikatorischen Ebenen sind „Pflanzliche Lebensformen“ und „Pflanzenart“, mit gelegentlicher Kennzeichnung von Volksgenera und Volksvarietäten. Die pflanzlichen Lebensformen werden als

Diskontinuitäten erkannt - was der Rationalismustheorie von Atran (1990) entspricht. Die Ausweisung tieferer taxonomischer Ebenen wird auch hier vom Nutzwert bestimmt - was mit Malinowskis (1974) utilitaristischer Sicht übereinstimmt. Die Digo Taxonomie berücksichtigt also einerseits die hohe hierarchische Ebene der pflanzlichen Lebensform, beruht aber überwiegend auf Unterscheidungen auf tieferen Ebenen („Gattungen“, „Arten“ und „Varietäten“), die aber selten mit der wissenschaftlichen taxonomischen Bewertung übereinstimmt. Sie entspricht damit Bulmers (1970) Ansicht einer mittleren Position zwischen "intellektuell" und "utilitaristisch".

Die Wahrnehmung interner botanischer Prozesse bei den Digo

Die Digo lernen im wesentlichen durch Beobachtung. So kennen sie zwar einige Einzelheiten der Pflanzenvermehrung, haben aber dazu kein durchgehendes Konzept. Ihre Auffassung der Pflanzen als weiblich wird reflektiert in der Bezeichnung von produktiven Stadien wie *Msichana* (Mädchen), *inamimba* (ist schwanger), *inavyala* (gebärt). Entsprechend werden als männlich erkannte Pflanzenteile vernachlässigt oder gar vernichtet. Konzepte wie Photosynthese, Bestäubung („Pollination“) und Befruchtung („Fertilization“) sind im Digo nicht vorhanden. Einige der Befragten gaben individuelle Schilderungen von vorstellbaren Vorgängen, z.B. beim Blütenbesuch von Insekten. Das Ergebnis dieser Untersuchungen zeigt, dass - im Unterschied zur Pflanzenbeschreibung - die Digo sich keinesfalls motiviert fühlen, solche Vorgänge zu verstehen. Sie geben persönliche Meinungen wieder, die nicht einer gemeinschaftlichen Kontrolle unterliegen.

Landwirtschaftliche Praxis bei den Digo

Die meisten landwirtschaftlichen Praktiken der Digo haben sich aus langer Erfahrung entwickelt, und haben zu festen Vorstellungen geführt, beispielsweise über die Bedürfnisse der angebauten Pflanzen, die Tragfähigkeit der Böden, über Pflanzenkrankheiten und Schädlinge. Ein Digo Landwirt klassifiziert Böden nach ihrer Ertragsfähigkeit, da dies ihre wichtigste Funktion ist. Einige traditionelle Praktiken sind aufgegeben worden aus politischen und sozialen Gründen. So war der Wechsel vom kommunalen zum individuellen Landbesitz auch ein Wechsel von kommunal kontrolliertem Anbau zur individuellen Farmbewirtschaftung. Auch dabei bleibt man allerdings weitgehend innerhalb traditioneller Praktiken einschließlich magisch-religiöser Maßnahmen und der ungebrochenen Präferenz lokaler Saatvarietäten, besonders beim Mais. Hybridmais wird in stillschweigender

Übereinstimmung abgelehnt. Der Einsatz von Magie bezieht sich auf eine wenig effektive Schädlingskontrolle und auf die ausschließliche Abhängigkeit des Feldbaus vom Regen. Misserfolg führt zum Einsatz psychologischer Ermutigungsmaßnahmen.

Prognosen über die Entwicklung des Pflanzenwissens bei den Digo

Auf den globalen Einfluss z.B. mit der wissenschaftlichen Botanik reagiert das botanische Wissen der Digo auf vielfältige Weise. Dazu gehören Umstrukturierung, Mischung und Widerstand oder Gleichgültigkeit. Entgegen der Annahme dass das Globale sich unvermeidlich mit dem Lokalen mischt oder dieses ersetzt, zeigen sich die Digo als Akteure, die nur dann Änderungen herbeiführen, wenn das Risiko materiellen Verlusts minimiert werden kann.

Beim Einfluss botanischen Grundlagenwissens gibt es kein materielles Risiko. Hier kann die in der Schule vermittelte Terminologie das traditionelle botanische Lexikon vorübergehend ergänzen, allerdings nicht in der Landessprache, sondern durch englische Termini. Derartige Ergänzungen sind aber in der Regel innerhalb von zwei bis fünf Jahren nach Schulabschluss völlig in Vergessenheit geraten. Hinzukommt, dass die meisten Schulabgänger durch intensive Mitarbeit auf der häuslichen Farm ihr traditionelles Wissen erweitern - was ihnen größere Überlebenschancen gibt. Eine Ausnahme von dieser allgemeinen Erkenntnis wurde jedoch in der Farbterminologie in der Pflanzenbeschreibung festgestellt, wo die traditionell auf drei beschränkten „basic colour terms“ (*nyiru* "schwarz", *nyereru* "weiß" und *kundu* "rot") einer Struktur mit mehr entlehnten Farbtermini weichen, vor allem bei jüngeren Sprechern. Die ursprünglichen termini bleiben aber in Nischen (z. B. der emotionalen Sprache und bei fixierten Wendungen) erhalten.

In der Phytotherapie hat die aufkommende nationale und globale Unterstützung zwar nicht die Essenz, aber die Verfahrensweisen beeinflusst (z.B. die Hygiene bei der Zubereitung und Standardisierung von Präparaten). Die Phytotherapie wird so stärker vermarktbar, beruht aber immer noch auf den traditionellen Substanzen. Dies verspricht gute Aussichten für eine "modernisierte" Digo-Heilkunde.

In der Landwirtschaft leisten die Digo Widerstand gegen Veränderungen, weil sie ums Überleben und nicht um Ertragsmaximierung kämpfen. Der Widerstand beruht auf einer langen Geschichte geringer Erträge und dem immer drohendem Hunger, also einer

"Hungerökonomie", die ihnen kein weiteres Risiko erlaubt. Das konservative Verhalten ist Überlebensstrategie und hat keine ideologische Basis. Eine Mischung mit modernen Techniken könnte vermutlich die Überlebenschancen erhöhen, ist aber ohne materielle Hilfe nicht praktikabel. Es ist zu vermuten dass sich die traditionellen Methoden in der absehbaren Zukunft halten werden.

ABSTRACT

The Digo are one of the nine subgroups of the *Midzichenda* (commonly known as Mijikenda), who inhabit the southern part of the Kenya coast, and they maintain sacred forests known as *kaya*. Traditionally *kaya* referred only to a cleared settlement area in the middle of the forest, but today the term is used to include the forested part. Thus, *kaya* today are the remnants of the ancient coastal forest, and are still of mythical significance to the *Midzichenda*. The persistence of the *kaya* forests has led to the conservation of plant utility values associated with traditional plant knowledge, views and beliefs. Since the Digo were the first to separate from the rest of the *Midzichenda* group, the original traditional plant knowledge may, at least partly, have been better preserved in its original form by this ethnic group. On the other hand, modern plant science has been introduced into the Digo community through teaching in schools and to the farming Digo population via consultations by government employees. This created a situation of two types of plant knowledge with only little overlap.

The aim of this study has been to document the 'traditional' Digo knowledge, practices and beliefs related to the plant world, which are threatened of being lost in the course of time. In addition, the study is intended to investigate the global influence (particularly modern science) on the Digo plant knowledge. To achieve these, the author – who is a Digo and grew up in that society, combined his 'native' experiences with his scientific training in botany, which is complemented by exposure in linguistics and anthropology – to unearth the rather hidden plant knowledge of the Digo. Traditional Digo plant users, viz. herbalists, farmers, carpenters, pole cutters, house builders, vegetable and mushroom collectors were interviewed and plant-related actions were observed. Also the 'modernists', i.e., pupils, students, teachers and Government extension workers were interviewed and observed. From the responses, explanations and observed actions, the traditional Digo plant knowledge was extracted, and the influence of modern science to that knowledge was assessed for a commentary on the future prospects of Digo plant knowledge.

The *kaya* elders are reputed as historical repository holders of cultural knowledge, and it was assumed that they have a comprehensive understanding of the Digo plant knowledge and hence were considered a primary source of information for this study. Surprisingly, it was noted that the elders maintain only a limited part of the Digo plant knowledge viz. the one that applies to social areas of their interests and trades e.g. farming, healing, and fishing. This observation is new, and it demonstrates a shift from the historical cultural inclination by *kaya*

elders to economically motivated strategies. Unfortunately, there was no other social group with comprehensive Digo plant knowledge in its entirety. Instead the knowledge is fragmented among various plant users. This called for consultation with a wide range of respondents to cover the diversity in the plant knowledge among different plant user groups, a fact that many ethnobotanists and anthropologists might have overlooked.

Digo plant knowledge is inseparable from the day-to-day life of the people, thus it forms an enormous field for a study. Although this thesis can not, by any means, be considered exhaustive, it can confidently be considered an exceptionally thorough attempt at the documentation and illustration of a traditional plant knowledge, as it focuses on the major knowledge domain areas in language and practice. The knowledge aspects that were covered can be summarised as:

- lexical expressions on plants and plant parts
- non-verbalised actions related to plant life
- categorization of plants
- cognitive understanding and explanations of the 'invisible' plant processes
- practical application of the traditional plant knowledge in agriculture
- and the interplay between 'local' and 'global' components of the plant knowledge.

Studies in these aspects are presented in individual but inter-related chapters, and in a sequence of increased complexity of knowledge – starting from the simple lexicon towards the high level 'reasoning' capacity, and finally commenting on the future prospects. In summary, Digo plant knowledge can be described as extensive in what is known (labels and descriptions), but at the same time it is voluntarily incomplete as there is a conscious ignorance of some areas of plant life, especially the non-observable processes such as sexual reproduction (pollination), nourishment (photosynthesis) and growth and development. Plant knowledge among the Digo is centred on value related objectives and the realities of social life, and can therefore be termed a 'practical knowledge'. The knowledge content and scope varies between different social groups, as a result there is no qualification equivalent to a 'general botanist', but there are professionals in specific trades that relate to plants e.g. healers, farmers, carpenters etc. The Digo encounter different global influences on their traditional knowledge, and there might be considerable change in the lexicon and the description of plant and plant parts in the near future, but traditional materials, particularly in agriculture and healing, will suffer minimal changes in content due to the necessities of life. The following are summaries of the individual chapters, presented chapter by chapter.

Digo plant lexicon and description

The Digo have a considerable verbal component in their plant knowledge, which includes 80 labels of plant parts, about 20 descriptive expressions for plants, and over 500 plant names. However, there are also non-verbalised areas e.g. term-less parts of flowers, and under-labelled plant features, such as colour, aroma, and taste. While some of the unlabelled aspects might be cognately perceived, others seem to be of no interest to the Digo. The Digo therefore, unlike botany scientists, are selective of what to address and what to describe, based on their social and economic interest. This can be appreciated to indicate that the Digo are not striving for completeness of plant knowledge.

The Digo terms for plant parts are not absolutely translatable into English or relatable to scientific equivalents. Thus there are only approximate equivalent terms between Digo and scientific terminology, e.g. *makodza* for leaves, *ruwa* for flower, *tunda* for fruit, and *muzi* for root, but in a strict sense, there are inclusions and exclusions that make these equivalents considerably different.

Digo plant lexicon is characterised by considerable transfer from the human/animal life elements to the plant part labelling and description. Such transfers are based on a better knowledge of the human life situations as compared to the situation with plants. Human/animal body parts labels such as *nyama* [meat], *mromo* [mouth], *dzitso* [eye], *mongo* [backbone], *mishipa* [veins], and *mala* [fingers] are used in labelling plant parts. On the other hand labels of plant parts such as *gopha* [bark], *sina* [basal stem], *kolo* [basal stem] and *mbeyu* [seed] are used in human life situations.

The Digo plant lexicon includes both old terms (inherited from common Bantu or proto-Sabaki) and contemporary terms (newly innovated or borrowed) to fill gaps where the old language did not account for labelling. Most loan words in the Digo plant lexicon are borrowed from Swahili. These observations depict Digo plant knowledge as being active, accommodating new observations, new values and new plant entries. Even during the field work of this study lexical ‘innovations’ and ‘loans’ in plant knowledge could be observed.

The incentive for both plant part labelling and description is to a greater extent, but not exclusively, value oriented. Thus plants and plant parts which are commonly used are labelled in detail, a fact that separates crop plants e.g. the coconut palm, from wild palms. A unique

feature observed for the Digo plant lexicon is the label focussing on an entity (i.e. the part), which sometimes changes meaning in a different socio-cultural context. Thus, a label that commonly refers to the flower can in some social functions be used to mean the leaf, or the same plant part is identified with different names in different occasions.

Traditional Digo plant identification methods

The Digo plant users are familiar with the botanical world important to them. Digo plant identification is characterised by familiarity, with only some precision on scientific characters, but little reliance on verbal descriptions. Through experience plant collectors identify plants on the bases of selected features that make 'fixed' images in their memory, thus the identification is done correctly but without any rigorous procedures. However, for inexperienced collectors and in new environments, individuals portray slowness and reduced confidence in the identification. In such situations rigorous identification methods (procedural) are used, and plant recognition is through observation of the useful plant part for different social groups, hence a multitude approaches in identification of the same species.

Among the Digo plant user groups, the timber users have supreme knowledge of inner wood features (colour, smell and wood grain patterns), but their knowledge is limited to timber species. Healers have advanced knowledge in diverse features (verbalised and non-verbalised) in many plant parts, including roots, which are least used by the other plant users. Healers are the only social group that can comfortably identify both fresh and dry specimens. Vegetable and mushroom gatherers are concerned with only the 'edible' plant. Otherwise, they generally disregarded knowledge in species not 'important' to them.

From a general view, preference of a plant part for identification depends on the scope of description and the linguistic expression of associated features. Leaves are the most described plant organs, and consequently are used in plant identification. Using leaves for plant identification, the Digo concur with science, but their disregard of flowers deviates from science. Other deviations of Digo from modern science in plant identification include the methods of identification. While science uses analytical methods, guided by rigid systems, the Digo use 'holistic' methods, and focus only on species of value and interest to them, disregarding a considerable part of the botanical world. While modern scientists are interested in the 'unknown' species or plant life and object to document the whole biological world, to the Digo additional

knowledge is appreciated only if it adds a new 'value' to their life, but knowledge on its own is not considered a 'value'.

Digo plant names and naming procedures

The Digo plant names consist of words and phrases of different forms and structures, but like other nouns and phrases in the language, the names abide to morphological and phonological rules of the language. Thus changes in the prefix of a plant name modify it to refer to different developmental stages of the plant. Some plant names however, have a prefix borrowed from 'female' human names, suggesting the perception of plants as 'female' beings. Further, there is evidence that 'unmarked' Digo plant names refer to the 'female' status, as in reference to 'male' plants (understood as an abnormal state) the names are always marked with the term *mlume* (for male).

In a corpus of 380 plant names, 40% are not semantically analysable, but evidence is shown that most of these are inherited labels, shared with other major *Midzichenda* languages (Duruma and Giriama) and Swahili. However, the plant names whose meanings were interpretable indicate that plant naming is guided by the following principles.

1. Utility value, particularly for plants used for magico-medicinal purposes.
2. Habitat, which includes *tsaka* [forest], *koma* [wild], *bara* [hinterland], *pwani* [sea side], *ziya* [lake], *munda* [farmland] and *nze* [outside farmland].
3. Relation or inferences to animal attributes or structural appearances.
4. Gender, expressed to differentiate similar plants, based on fruit production or structure of plant parts.
5. Physical characters of the plant parts, including colour, smell, taste, and size of parts
6. Plant habit, particularly relative to growth (twining, piling, parasitic and epiphytic).

Similar to the descriptive lexicon, Digo plant names comprise of names of different historical ages, ranging from over a thousand years old to less than a hundred years old, which emphasizes the evolutionary course of Digo plant knowledge and vocabulary. Updates in Digo plant names are through innovations and loans from other languages. It is interesting that the innovations stick to the unwritten traditional guiding principles, e.g. only the primary colour terms (*nyiru, nyereru* and *kundu*) are used in plant labels; and the old terms for smell (*nuuk*, modified to *nuka*), and taste (*ucung*, modified to *utsungu*) are used.

Digo folk taxonomy

Features of Digo folk taxonomy are only remotely comparable to scientific taxonomy, and do not correspond to comprehensive folk taxonomies as reported by Berlin (1992) and other ethnographers, but concurs with Kakudidi's (2004) shallow ranking. In Digo there is no label or description of the unique beginner, i.e. there is no term equivalent to 'plant', and therefore 'plant kingdom' is not a recognised rank in Digo folk taxonomy. The clearly recognised folk taxonomy ranks are life-forms and folk species, with occasional presence of folk generics and folk varietals. The life-forms are differentiated on the basis of discontinuity of kinds, which is consistent with Atran's (1990) rationalism theory; but the recognition of lower taxonomic ranks is biased towards species of utility value, which agrees with Malinowski's (1974) utilitarian view. The Digo folk taxonomy, therefore, expresses itself as an intellectual thinking at the high rank categories (plant life-forms), but bases the perspectives of social reality and practical interests at the lower rank categories (folk generics, folk species and folk varietals), thus taking an intermediate position between 'intellectual' and 'utilitarian', which is in line with Bulmer's (1970) view.

Digo perception of internal plant processes

The Digo learn most of their plant knowledge through observation. As a result they know some details in plant propagation, including propagules and the specific part of a plant organ where 'new plants' develop. However, scientific concepts are not shared with the Digo comprehension. Their perception of plants as 'female' beings is emphasised in the 'feminine' description of plant developmental stages viz. *msichana* [girl] for the stage just before the first fruit production; *inamimba* [is pregnant] for plant with flower buds, *inavyala* [is giving birth] for a plant bearing fruits. The perception of plants as being female is further twined with an understanding that male plants and plant parts are irrelevant in plant reproduction and propagation. Thus male inflorescence in maize does not play any role in maize production, and male papaya plants are cut down in the farms. Associated scientific concepts such as pollination, fertilization and photosynthesis are thus not perceived. However, some respondents gave explanations related to reproduction, particularly for observable events such as the insect and flower association. However, the observation made indicated that at a community level, it is deemed not an obligatory commitment for the Digo to understand fine details in plant processes, a practice which contrasts with labelling and descriptions of plants and plant parts. Thus, the individuals only contemplate on details in plant processes as a

leisure, at will and freely, to the best of their imagination. They do not feel obliged to make explanations that are conceptually justifiable or to convince anyone with what the say. In other words, these are only personal opinions that can not be termed 'right' or 'wrong' from a communal knowledge view.

Digo farming practices

A great part of the Digo farming knowledge reflect past experiences, and an understanding of the correlations between different components such as demand of crop plants, performance of soils, diseases and pest menace, has been stabilized. A Digo farmer recognizes and classifies soils in a way related to crop production, which is his priority investment. In practice today, some old farming practices are maintained, but others have been dropped due to various socio-political reasons. Some traditional farming practices related to soil fertility management were affected by the change in the land tenure system. The shift from the customary communal land ownership to individual ownership was also the point of departure from a 'communally' controlled and managed agriculture to 'free style' individual farming practices and management. However, even with individual management, Digo farmers maintain to a considerable degree traditional practices, which include magico-religious measures and practices, and continued preference of local seed varieties, particularly in maize farming. There is a unanimous but silent rejection of the hybrid maize. The application of magic in farming is based on the relatively less effective approaches in pest management, and their exclusive reliance on rains, which are not reliable. These frequently lead to frustrations as a result of crop failures, hence the consultation of 'psycho-confidence' for hope and courage.

The future of Digo plant knowledge

In the face of global influence such as scientific botany, the Digo plant knowledge reacts in a multitude of ways, which include: complementation, re-structuring, blending and resistance. Contrary to the belief that modern or global (science) inevitably replaces or blends with the 'local', the Digo are active actors, selective of what to change based on the risk of material loss.

In plant lexicon and description, where there is no risk of material loss, change is acceptable. Thus school-mediated plant knowledge complements the Digo lexicon for parts that are not labelled. But these are rapidly forgotten in the post-school life, thus the scientific terms are

not likely to form the day-to-day Digo plant lexicon. In addition, in the post-school life, people show improved traditional plant knowledge as they become almost full time helpers in domestic farming, which gives Digo plant knowledge a potential to survive. But in plant descriptions, the restructuring of the colour terms is evident. The traditional role of the Digo primary colour terms (*nyiru, nyereru* and *kundu*) in plant description is fading off, while simultaneously the application of the 'new' colour terms (*grini* and *chijani*) among the 'young' Digo speakers increases. However, the language is creating niches for the survival of the exclusive application of the 'basic' colour terms in emotional and standard phrases.

National and global support to Digo healing has not hybridised it in its essence, but has modernised it in form, i.e., in hygiene, standardisation of dosage etc. Consequently, the healing system is helped to become more marketable and competitive, but the traditional cures (including plants) are employed as the main phytotherapeutical substances. What is clear, however, is that the 'blended' Digo healing has a good future perspective, and the traditional cures and knowledge will continue to be used.

In agriculture, the Digo farmers, whose agency is framed by struggling for survival, resist modern agriculture, partly due to the costly material. The observed resilience towards global influence by Digo farmers is based on a long history of low yields and imminent hunger, and therefore they cannot afford to enhance risks in their already marginal economy. Their apparent conservatism has no ideological value for them but is a strategy for survival. Although it is commonly recognised that chances of survival of the community depend on high crop yield through adoption of modern agricultural inputs, lack of material support to the Digo farming strengthens the continued existence of traditional farming practices, which will persist into the foreseeable future.

The argumentation and description given in the chapters, as summarised above, is complimented by seven Appendices, which cover further details such as: aspects of Digo linguistics (Appendix IV), field notes on Digo plant identification (Appendix V), notes on the semantics of plant names (Appendix VI), and Digo annual agricultural calendar (Appendix VII).

CONTENTS

CHAPTER THREE: THE DIGO LANGUAGE AND ETHNOPHYTOGRAPHY

CHAPTER FOUR: TRADITIONAL PLANT IDENTIFICATION AND COLLECTION NORMS

CHAPTER FIVE: DIGO PLANT NAMES AND NAMING CRITERIA

CHAPTER SIX: FOLK TAXONOMY AND CLASSIFICATION

CHAPTER SEVEN: *MBEYU* – A DIGO PLANT CONCEPT

CHAPTER EIGHT: DIGO TRADITIONAL FARMING KNOWLEDGE AND PRACTICES

CHAPTER NINE: THE FUTURE OF CONTEMPORARY DIGO PLANT KNOWLEDGE

LIST OF TABLES **PAGE**

LIST OF FIGURES **PAGE**

LIST OF APPENDECIES **PAGE**

CHAPTER ONE
GENERAL INTRODUCTION

1.1 CONSIDERATIONS ON ETHNOBOTANY

Striving with the natural burdens of their domestic needs, human populations have developed a multitude of practices which to a certain degree warrant their life. In the current days such practices may be encountered particularly in the tropical developing countries e.g. the sub-saharan Africa (Getz *et al.* 1999, Infield 2001; Brosius 1997; Berkes 1999). Over time, the traditional practices of local populations, their social ethics, technologies and beliefs, emanate to a way of life based on a knowledge referred to here as 'traditional knowledge'. Traditional knowledge is still vital for the local people of Africa as it cuts through forests, water, and agro-ecosystems, ranging from farmland to wilderness (Pandey 2004). Ethnobotany is the study of the traditional knowledge, specifically, the relationship between the humankind and their plant world (Brown 1984). Berlin (1992) sums up the motivation behind ethnobotanical studies as to 'reveal much about the way people conceptualise the plant life in their environment.'

Over the last decades ethnobotany has assumed a significant scientific attention, with endorsements from institutions of a high international profile such as Kew, the Royal Geographic Society, World Wide Fund for Nature (WWF), United Nations Development Program (UNDP), and United Nations Educational, Scientific and Cultural Organization (UNESCO) (Ellen 1996). Ellen (1996) differentiates two phases of ethnobiological research which he labels as the 'old' and the 'new'. The old ethnobiology focused primarily on identifying plants (and animals) that are considered important in a material culture and on the uses by locals. The new ethnobiology, which began in the 1950s, emphasizes rather the linguistic, mainly semantic aspects of folk biological knowledge. Semantics is assumed to be the key to unveil what exists and what is important in a human group (Brown 1984). According to Ellen (1996) the old ethnobotanical studies (a branch of ethnobiology) focused on traditional knowledge as an economic commodity and researchers were eager to exploit it through demonstration of its usefulness. This led to simplistic conceptions of ethnobotanical knowledge that tended to make ethnobotany a subject that represents a common course but lacks unifying theories (Ford 1978). This, Ellen explained, was due to the historically different traits of biological ethnobotany and anthropological ethnobotany, whereby the former operates within the bio-economic paradigm, while the latter operates primarily within

a cultural-linguistic paradigm. While biological ethnobotany (the old) resulted in data that is no more than species identifications against vernacular names, and lists of plant uses, anthropological ethnobotany (the new) investigates the relationships between plants and humans by placing plants in a comprehensive cultural context. Although there is a considerable overlap between the body of data of the two kinds of ethnobotany, Ford (1978) claims that 'new' ethnobotany should represent the advanced mode of ethnobotanical research.

1.2 HISTORICAL AND SOCIAL SETTING OF THE DIGO

The Digo are one of the nine *Midzichenda* ethnic groups, known in their Swahili designation as *Mijikenda*. The *Midzichenda* are a Bantu-speaking people consisting of nine ethnic groups that are linguistically and culturally closely related (Willis, 1996), but still with considerable differences in their ethnobotanical background (Pakia & Cooke 2003a, b). The term *midzichenda* is purely descriptive, which literally means 'nine homes', referring to the nine constituent ethnic groups, namely, the Digo, Duruma, Giriama, Rabai, Chonyi, Kambe, Ribe, Kauma, and Jibana. The *Midzichenda* settled at the Kenya Coast in the 16th Century (Spear 1978) or earlier (Morton 1972; 1977; Walsh 1992; Willis 1996), after emigrating from the North following a war between them and the Galla. Their typical settlements were fortified forest villages, known as *kaya* (Spear 1978; Schmidt 1991; Willis 1996), found in the 'ancient coastal forest' of eastern Africa (Robertson & Luke 1993; Burgess *et. al*. 1998), which are rich in botanical diversity (Robertson & Luke 1993; Burgess *et. al*. 1998). During their historical *kaya* life, the wild plant resource has been of great importance to the *Midzichenda* for a wide range of basic needs (Pakia & Cooke 2003a). Over the centuries the *Midzichenda* accumulated a wealth of traditional botanical knowledge, with associated practices and beliefs, which became part of their culture. Although in the 19th Century the *Midzichenda* started to move out of the *kaya* villages to occupy vacant land outside, where extensive farming started (Robertson & Luke 1993), the *kaya* continued to be revered as sacred ancestral areas and places of worship. In addition, the *Midzichenda* who still maintain a great proportion of their traditions, continue to use the wild plant resources in the *kaya* forests and other wild areas.

1.2.1 Area and number of speakers

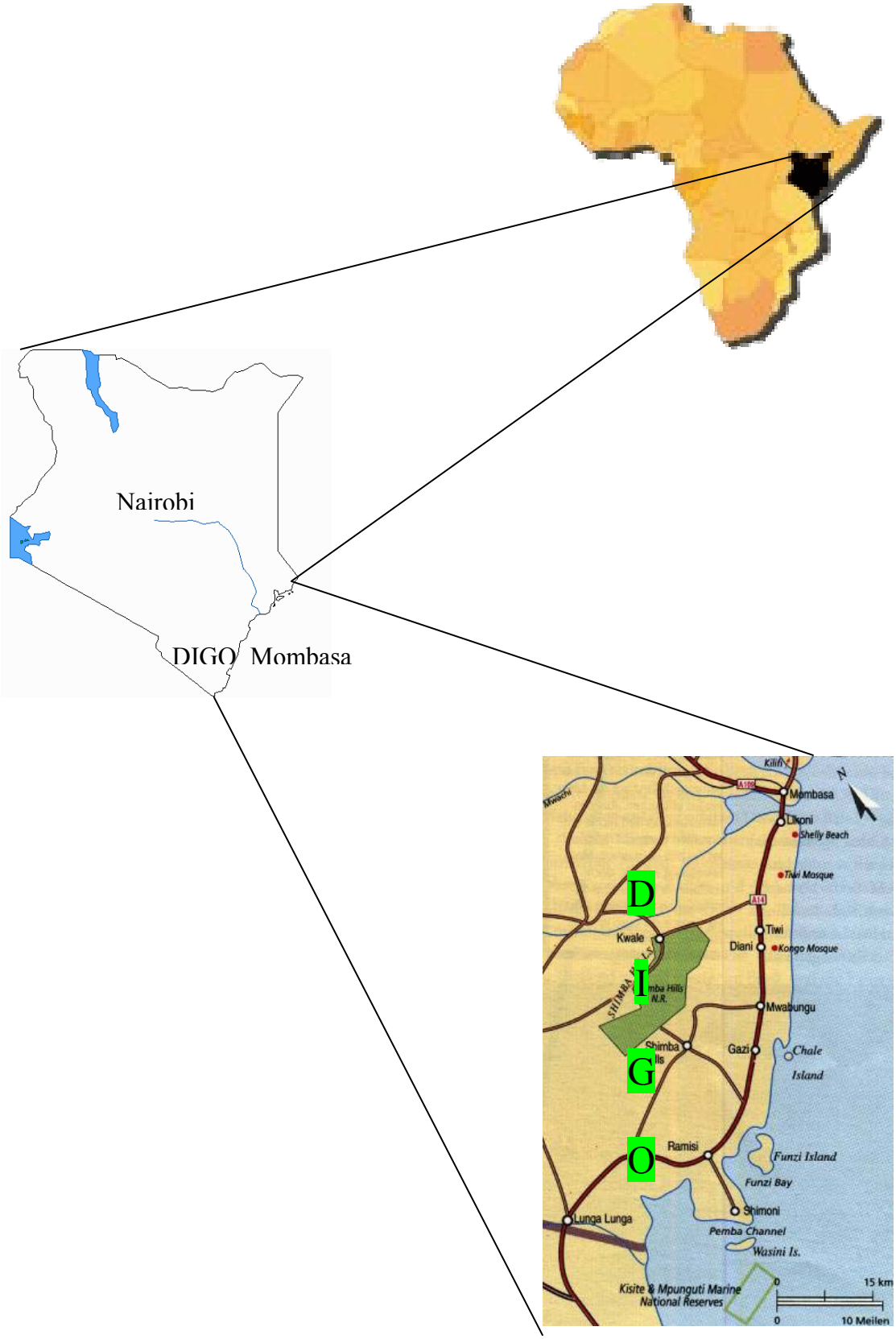
The Digo are a population of farmers and fishermen who live in the coastal belt stretching from south of Mombasa in Kenya to Tanga in Tanzania (Map I). Their populations are given

as 101,336 for Kenya, in 1966; and 18,688 for Tanzania in 1967 (Nurse & Hinnebusch 1993). In the 1979 population census the figures were given as near 700,000 for all *Midzichenda*, and the Digo are the second largest group after the Giriama (Nurse & Hinnebusch 1993). An unconfirmed population figure for the Kenyan Digo for 1999 was given as 225,000 by an official in the Kwale District statistics office.

1.2.2 Socio-linguistic situation

Although the data for this study is exclusively from the Kenyan Digo, there is no important difference between the Kenyan and the Tanzanian Digo as far as language is concerned. There are also Swahili speaking settlements (mostly urban centres) in the narrow coastal belt. The Digo are partly neighbours of Swahili speaking groups and partly share their territory with them. English and Swahili are the two national and official languages in Kenya. In secular learning institutions, teaching is in English, but Swahili is the Linguafranca. Based on personal observations, the author can state that almost every Digo speaks and understands Swahili, even if he or she does not have a formal education, he would still know and use Swahili to some degree. Furthermore, the Kenya coastal area consists of a dialect continuum with a high degree of code switching, borrowing and mutual intelligibility. This applies not only to the relation between the *Midzichenda* languages, but also between Swahili and *Midzichenda*. There is a long history of contact and interchange between *Midzichenda* and Swahili (Nurse & Spear 1985, Spear 1978), hence in many cases the code switching is not intentional, in so far as the speakers are not always aware in every word in their daily use of language whether it is a Swahili or a Digo word. The Swahili used especially by uneducated Digo is not up to the standard level, but also the 'correct' Swahili used along the Digo coast is full of local peculiarities. In that sense one may speak of a continuum between 'pure' Digo and 'pure' Swahili. This includes plant names, and plant characteristics. In addition, *Midzichenda* and Swahili form a closely related group of languages. Thus we find a Swahili-Digo language area which is to a considerable extent a result of either contact or common heritage, and it is often impossible for the linguist to identify the kind of relationship that underlies a given case. What will be presented here as findings for Digo may in part also apply to Swahili but has not been verified yet (Rottland & Grosserhode 2004). On the other hand, English is much less known.

Map I: The geographical settlement area of the Digo in Kenya Coast.



In addition to contacts with the Swahili speakers, the Digo are also in contact with the Indian and Arab communities. On the West the Digo are neighbours of other *Midzichenda* ethnic

groups (Duruma and Rabai). To the East the Digo territory borders the Indian Ocean, from which they derive one of their subsistence, namely fishing. Other economic activities of the Digo are agriculture and small scale livestock keeping. However, their proximity to other ethnic groups in the urban centres and the presence of various industries in the area, have led to supplementing the reliance on their natural resources with employment earnings. Amidst the Digo, there are immigrant populations of Kenya up-country communities i.e. Kamba, Kikuyu, Luhya and Luo, and some from Tanzania. These folks were attracted to the Kenya coastal area by jobs in tourism industry, sugar industry, and availability of land for farming (Were *et al.* 1987). Presumably, following the commercial and other social encounters of the Digo with other *Midzichenda* tribes, Swahili, Afro-Arab, Indian and Western cultures, in the past and in the present, there was and still is, a great exchange of cultural elements, particularly in knowledge, practice and language. Thus, apart from describing the actual Digo plant knowledge, this study also aims at identifying external influences that have and still are affecting that knowledge.

1.3 PREVIOUS STUDIES

Parts of the Digo ethnobotanical knowledge and practices have been documented in several studies (Greenway 1940; Glover *et. al* 1969; Hawthorne *et. al* 1981; Schmidt 1991; Pakia & Cooke 2003a; and Pakia & Cooke 2003b). Other studies at the Kenya Coast focused on the history of the *Midzichenda* (Griffiths 1935; Morton 1972, 1977; Prins 1972, Spear 1978; Mwangudza 1983; Mutoro 1985; Mambo 1987; Walsh 1992; Willis 1996). The floristic composition of the *Midzichenda* sacred forests (the *kaya* forests) and other forest areas (Robertson 1984; Schmidt 1991; Robertson & Luke 1993) revealed a high diversity of the forested area at the Kenya Coast, encompassing about 3,000 plant taxa. Although some of the previous ethnobotanical studies addressed anthropological issues of the *Midzichenda*, the majority of the plant related practices and semantics is still not documented, particularly, the details for the individual *Midzichenda* ethnic groups are lacking. Thus, it was felt imperative that the traditional Digo plant knowledge is documented, so as to preserve the indigenous knowledge, the language, and customary beliefs associated with the plant world. Such knowledge, if it remains undocumented, is likely to disappear as people globally become drawn into a homogenized culture of the modern world (Diamond & Bishop 1999). It was on the basis of this argument that the current study was deemed necessary and hence undertaken.

1.4 THE CURRENT STUDY

1.4.1 Background

This study was inaugurated by the Humanities Collaborative Research Centre of the University of Bayreuth (Sonderforschungsbereiche: SFB) financed by the German Research Council (Deutsche Forschungsgemeinschaft: DFG). The special criteria of the Humanities Collaborative Research Centre are: Transdisciplinary approach, international cooperation and internationalization of research with regard to the choice of the topic, as well as academic capacity building. The disciplines that participate in the Centre include: Languages and literature, Art, Developmental Sociology, Social Anthropology, History, Private and International Law, Islamic Studies, Cultural and Social Geography, Plant Sciences, and Religion. The aim of the Centre is to investigate local action in the context of global influences, by focusing on current situations, and tracing them back to the past phenomena.

1.4.2 The aim of the study

As stated above, the aim of this study was to document the 'traditional' Digo plant knowledge, practices and beliefs related to the plant world, which are threatened of being lost with time passing by. In addition, the study is also intended to investigate the global influence (particularly modern science) on the Digo plant knowledge. The field work of the study was conducted at the Kenya Coast, between August 2000 and July 2004. The field work was followed by six months of data analysis and writing, between August and December 2004, at the University of Bayreuth, in Germany.

1.4.3 Motivation for the selection of the Digo and Plant science

The Digo were the first group to separate from the rest of the *Midzichenda* (Spear 1978) which on the one hand makes them more likely to have maintained some of the 'old' knowledge, practices and semantics related to plant world. Thus the Digo have significant features of 'traditional' setting, which include the historical *kaya* culture, an active Language (*Chidigo*), components of socio-cultural life (such as fishing, farming and phytotherapy) which were practised long before the entry of modern science. However, on the other hand, part of the Digo area is a melting pot of other ethnic groups from up-country Kenya, Arabia,

Inda and Europe (Were *et al.* 1987). The experience of the Digo, therefore, gives an incentive of local and global elements of varying significance.

The choice to concentrate on plant knowledge in this study is based on the fact that plant knowledge is more instructive, and plants have a long lifespan cutting across human generations. The Digo have a strong relation to, and respect of, the plant world, which can be traced to their historical association with the *kaya* forests. In addition, they (until early 1980s) pegged their wealth indication to plant ownerships (e.g. the number of coconut trees). Still to date, the plant world has a very high economic value to the Digo (Glover *et al.* 1969; Schmidt 1991; Pakia & Cooke 2003 a, b). Despite this traditional background, the young Digo are encouraged to go to school (schooling was made compulsory in the year 2003), where they learn theories of pure science and practices of modern agriculture. In this scenario, it is of interest to investigate how the traditional knowledge reacts to modern science.

The author, being a native Digo (grew up in that society and is fluent in the language) and has studied Botany in South Africa, identified features of traditional Digo plant knowledge which could be used to compare, at least the partially coherent ideas, into what could be termed as a Digo plant concept. To this end, not only verbally expressed knowledge but also observational data have been compiled. Since the author is a local, there were no restrictions in active participation and observation of the Digo in their life, as they undertake their day to day socio-cultural activities, while maintaining a mutual trust and honesty in the community.

1.4.4 Assumptions and expectations

At the onset of field work, the general assumption of this study was that "another plant knowledge exists, which developed prior to the modern scientific knowledge". This would be proven by the existence of a kind of Digo plant knowledge that is 'consistent in its content'. A second expectation was that in the Digo community, a specific social group exists which is the repository of the traditional plant knowledge, representing the status of a leadership in plant knowledge. That group was presumed to be the *kaya* elders (a council of elders charged with preservation of traditional rules and traditional plant resource management). A third expectation was that global and local knowledge would integrate smoothly, with the global i.e. scientific system, replacing or at least modifying the local. Modification would be indicated by an opening of Digo plant lexicon and practices such as in agriculture and healing. In the course of the study it became obvious that all these assumptions and expectation were

not correct. These literature-based and conceivable assumptions were falsified by a thorough and systematic investigation into a field which had not been addressed in a similar comprehensive study.

1.4.5 Content of the Thesis

In the introductory, Chapter One, the background of the Digo and their inclination to the botanical world is reviewed, as well as their linguistic history and relation to Anglo Bantu. Chapter Two presents the methodology used in field work and data analysis. Also described are the persons (respondents) involved in eliciting the Digo plant knowledge.

Chapter Three gives an overview of the relevant Chidigo linguistic and ethnophytological (plant lexicon and description) aspects, including etymological interpretations and historical aspects of the lexicon. This is followed by a discussion of the traditional plant identification methods (Chapter Four), exploring the plant characters and human senses used for the identification. Chapter Five discusses the morphology and phonology of the Digo plant names based on semantic analytical approach, to unravel the guiding aspects in the Digo plant naming process. This is followed by a discussion on how the Digo order their plant world, i.e. Digo folk taxonomy in Chapter Six.

In Chapter Seven the Digo understanding of 'the not so visible' internal plant processes is assessed through an example, namely '*mbeyu*', a traditional notion related to plant propagation. Important issue in this Chapter is to establish the extent of Digo plant knowledge beyond lexicon and descriptive terms. In Chapter Eight, practical Digo plant knowledge in their day to day life is presented, exemplified by farming. In an Appendix, Digo knowledge in the times and indicators of rains, for land preparation, sowing, weeding, harvesting, methods of crop storage and communal controls in agriculture are presented.

In the last Chapter, Chapter Nine, Digo plant knowledge encounters modern scientific botany and agriculture. The discussion extends on the future prospects of the Digo plant knowledge and its associated practices.

1.4.6 Conventions and abbreviations

The following conventions have been used in the text of this thesis. Digo plant names appear in italics, and are treated as nouns, spelt with an upper case of the first letter. Other Digo words are also written in italics in lower case. Translations or respective terminologies of the Digo plant names and words are given, and these are put in square bracts […]. The scientific equivalents to Digo plant names are not always included, and the reader is recommended to Appendix III which has all the Digo plant names and their scientific correspondences referred to in this thesis and sorted in alphabetic order. Digo compound plant names are written as 'short phrases' with the different words separated, including the genitival links e.g. *Mwinika ngulu* and *Mnazi wa tsozi*. The spellings for the Digo plant names and other Digo words are done in accordance with the orthography given in Appendix IV.

Commonly used abbreviations are:

pp.	pages
pl.	plural
singl.	singular
sp.	Species (single)
spp.	Species (plural)

CHAPTER TWO
MATERIALS AND METHODS

2.1 RESEARCH STRATEGIES

Inevitably, the modern concept of plant science represents the background of the ethnobotanical study. Modern plant science was used to identify essential areas of plant life and defining the subject areas covered such as: plant description, plant identification, plant classification and propagation. The role of *linguistics* in this study is to analyse the semantic composition of Digo plant knowledge and thus prepare the way towards an understanding of its cognitive structure, as well as to identify changes in terminology which can be analysed as features of globalisation. In general the investigation took the following strategic approach:

i) document the traditional plant labels and descriptive terms for plant parts, which on the whole forms what will be considered as the Digo plant lexicon.
ii) determine the features and methods used in traditional Digo plant identification and recognition methods.
iii) establish the traditional plant naming criteria, through analysis of the semantic meanings of the Digo plant names.
iv) determine the traditional categorisation and grouping of plants among the Digo.
v) document the traditionally conceptualisation of plant processes through an exemplified Digo plant concept, the *mbeyu.*
vi) document the practical plant knowledge of the Digo, using traditional farming systems as the example.
vii) commenting on the future prospects of the traditional Digo plant knowledge by assessing the global influence in plant lexicon and plant related practices such as agriculture and healing.

The research therefore targeted both verbal and non-verbal data, covering the subsistence activities of the Digo that pertains to plant world. It is a fact that most traditional knowledge is dispersed widely, organised with respect to particular contexts, and defined in terms of different subsistence activities in a community (Ellen 1996) and the Digo are no exception in this. Much of the traditional knowledge therefore might be inaccessible except via a research strategy which allows for multi-focal approach. Thus, in this study a combination of field methods were used to tap as much of the targeted data and information as possible. The methods included both quantitative formal methods and qualitative informal techniques. The

quantitative formal methods comprised interviews using a structured questionnaire (Appendix I). While the informal qualitative techniques included semi-structured interviews, open-ended discussions, active and passive observations of the day-to-day socio-cultural and economical activities of the Digo.

Evidence from the field work of this study showed that some respondents tend to take a friendly position in interviews and discussions, hence give 'what you would like to hear' answers, beating the objective of the researchers. With the current author, however, being a local in community helped to minimise if not completely avoid such drawbacks. The author had a general idea of the situation, and respondents felt obliged to present honest responses. On the other hand, the author took a perspective of an external observer of his own community, so as to view the traditional knowledge and practices from a different, scientific perspective. At the end of the day the author realised that there is considerable traditional knowledge that he did not know prior to indulging in the study, despite being a local.

2.1.1 The formal quantitative method

A formal qualitative method consisted mainly of the structured interviews, which were used to allow for involving a relatively large number of respondents, and conducted using a questionnaire (Appendix I). The rationale behind using a questionnaire was to secure a substantial quantitative data, as respondents give answers to the same set of questions, which allowed for systematic considerations, as well as noting variability between individual respondents and between social groups.

The questionnaire

A questionnaire was developed, then tested in the field to establish that targeted botanical knowledge was captured. Responses obtained in the preliminary interviews noted that the Digo understanding of their plant world was not accessed from general questions, but rather from questions that exemplified the life or features of specific plants. Although the questionnaire was maintained, semi-structured interviews and open ended discussions focused on specific species. The questionnaire consisted of 25 questions that covered different areas of plant knowledge, and responses were sorted out and discussed in related subject matter of respective Chapters. However, in summary, the questions can be broadly grouped as:

- General questions (for general plant life) – addressed in questions 1 – 9.

- Plant identification – question 10.
- Plant classification – questions 11 – 13.
- Plant development (Digo concept of plant propagation) - questions 14 – 17.
- Practical plant knowledge (agriculture and phytotherapy) – questions 18 – 25.

Respondents sample used in structured interviews

The respondents, for both structured interviews and discussions, were mainly the Digo who share a cultural heritage that includes the plant knowledge. The persons involved (referred here as 'respondents') were selected from a cross-section of social groups of the community in order to capture their diversity in the knowledge (Appendix II). Respondents were considered along specific social groups, age, gender, and literacy variations. However, the responses showed that, other than variations between social groups e.g. healers, farmers, and carpenters, considerable variation in plant knowledge is observable between two respondent groups, namely:

a) the elderly, illiterate or semi-illiterate, mainly practising the traditional Digo life and

b) the young, modern, educated or in an educational institution, exposed to modern science.

The elderly Digo respondents comprised of *kaya* elders, traditional healers, peasant farmers, pole cutters, local carpenters, local house constructors and house wives. Most of the respondents in these categories live in the rural areas of Kwale District, Coast Province, Kenya, while the 'modern' Digo are pupils in primary and secondary schools, and Government extension officers, whose interests are in the western life style and modern science. Most of these were living in the urban centres, from where they were attending their studies or work, and usually separated from their families. Another group of respondents linking these two extremes were the post-school youths, who had rejoined their families after studies, thus were living in their rural villages and participating in domestic activities such as farming.

The respondents were visited at their homes for the interviewing. Some respondents were re-visited every year for four years consecutively, to confirm previous information that was collected as well as sought new information. The respondents were selected from the Digo area that stretches between Waa and Msambweni, a distance of about 40 km South-North along the Mombasa-Lungalunga road, and between Tiwi and Golini, a distance of about 20 km East-West along the Mombasa-Kwale road.

The media of interviews

To capture most of the targeted information and to create a levelled platform, the interviews were all conducted in the Digo language, *Chidigo*, which was familiar to most respondents, although some of the young Digo seemed more comfortable in presenting themselves in Swahili or English. The use of *Chidigo* allowed for a comparative analysis between respondents within and between the social groups. In addition, it allowed for recording fine details of linguistic concern in their 'original' formations. There is a common tendency of 'Swahilinising' words in interviews or discussions conducted in other than *Chidigo*.

2.1.2 Informal qualitative techniques

The informal qualitative techniques included semi-structured interviews (guided discussions), open ended discussions, and observations. Semi-structured interviews and open-ended discussions involved selected respondents who had profound knowledge in the traditional Digo plant knowledge, and were involved in discussions that focused of specific plant aspects that they have considerable conversancy. In semi-structured interviews there were specific target areas of discussion, and although a respondent was allowed expound on these, he was guided to a certain extent not to move out of the targeted discussion area. The main target in these interviews was qualitative data, particularly specialised information that might not be commonly found among other community members. During open end discussions the respondents were allowed to respond to general questions in a selected topic of plant knowledge, and were allowed to talk freely on related issues so as to capture as much as the respondents could offer. Overall, both the semi-structured interviews and the open-ended discussions allowed for eliciting from the respondents a rich and detailed qualitative data that forms part of Digo plant knowledge.

On the other hand, the observations of the local people in their day to day activities, included visits to traditional ceremonies, initiations, trade fairs, learning sessions, plant material collection and working sessions in the farm fields. In these activities, the author participated as an active observer and sometimes as a passive observer, thus taking both internal and external views of the activities. As a method, observation (both active and passive) allowed for critical uncovering in detail the practical part of the plant knowledge in day to day life of the Digo. This method was significantly useful in ensuring that both verbal and non-verbal knowledge components were captured and recorded.

The methods and techniques above were used in supplementation to allow for wider coverage and capture of the Digo plant knowledge. In total 177 respondents of different social and academic background (Table 2.1) were involved in the interviews and discussions.

Table 2.1: A summary of the group categories and number of respondents involved.

Respondent category	**Number**
Kaya elders	10
Farmers	40
Healers	13
Pole cutters/ house builders	7
Carpenters	8
Vegetable and mushroom gatherers	19
Government Extension officer	1
Secondary school pupils	51
Primary school pupils	9
Post school youths	19

Out of 177 persons, 65 were female and 112 were male, consisting of 60 elderly persons (50 years and above), 80 young adults (18 – 50 years old) and 37 youths (less than 18 years old). Although the elderly respondents were mainly illiterate or semi-illiterate, most of them had minimal religious knowledge following an exposure in Islamic schools, i.e., madrassa. This respondent group category generally believed and trusted the traditional practices, but occasionally had some little knowledge on the modern scientific knowledge which they learnt informally from friends or from the Government extension officers. Ten selected elderly farmers were the key respondents, who were visited annually to clarify or expand on an issue in the traditional plant knowledge.

The interviews were conducted in the period between August 2001 and June 2004. In addition to the responses recorded in these interviews, other published ethnobotanical works documented in the same area (Pakia & Cooke 2003a, b; Beentje 1994; Schmidt 1991, and Glover *et. al* 1969) were consulted as secondary sources of information particularly for the plant names and uses.

2.2 SPECIFIC FIELD ACTIVITIES FOR THE STUDY

- respondents were visited at their homes and interviewed using the structured questionnaire

- some respondents were conducted through the forest, and were requested to give the terms used as labels for different plant parts (in general and for specific species). Also the respondents were requested to describe the different features of the plant parts, and give other descriptive terms related to plants. Occasionally photographs of plants were used for the same.
- during the forest visits, some respondents were requested to identify different plant taxa. In these sessions the verbal responses were recorded and the behaviour of the respondents in the plant identification process were observed keenly, particularly the plant parts the respondents focused on in the identification. Also some respondents were requested to give an elaborate explanation on their methods of plant identification and the plant parts they considered important for identification.
- respondents were also requested to give membership of different plant species to categories of higher ranking and the names for these categories. This was done by allowing the respondent to use his/her own examples, but sometimes suggested examples of species and categories were presented to the respondents to kick start the discussion. From these discussions, information on Digo plant classification and respective classificatory terms were collected.
- during semi-structured interviews and the open-ended discussions some respondents were intentionally pushed to answer questions, particularly when their responses were conflicting i.e. inconsistent. This was useful to establish the position of 'conflicting knowledge' in the Digo plant knowledge. But some respondents seem to express being offended when their arguments were proved to them as incoherent.
- in addition to visiting the peasant farmers at their homes for interviews and discussions, visits were also made to their farm fields (in their company) to observe the applied farming methods and practice. Selected farmers were re-visited every year for four consecutive years, responding to the same questions to establish consistency of their responses.
- some respondents were involved in discussions of the non-visible plant processes, particularly those related to plant propagation, development and nourishment. This was intended to investigate the Digo understanding of plant concepts, equivalent to the scientific ones like photosynthesis and pollination, a knowledge area above simple lexicon and description.
- pupils and students were visited in their schools, involved in interviews and discussions, and their learning sessions observed.

2.3 ANALYTICAL AND COMPARATIVE APPROACH

In order to structure the Digo plant knowledge and to distinguish its global from its local aspects a certain degree of focusing is needed as well as some terminological reticence. The global aspect referred to here is scientific botany, which enters the local scene directly through schools or indirectly through the work of agricultural advisors and occasional training courses for local healers and farmers. The other branch of the dichotomy is the traditional Digo botanical knowledge that has not been influenced by the global system (e.g. farmers who have not been to school and who have missed or avoided agricultural training). Thus, what was gathered from observations and interviews with elder farmers is considered as the "traditional" Digo plant knowledge.

Since the scientific knowledge is introduced into the Digo community through school, Digo pupils and students are considered as holders of the 'modern scientific' knowledge. Partly, by using a comparative analysis between these 'educated' young Digo and their 'illiterate' elderly parents, plant-related semantics and practices were contrasted. Overall, the analysis attempted to establish the extent the 'global' (modern scientific botany) influences the 'local' counter part (traditional Digo plant knowledge), in order to estimate the future prospects of the Digo plant knowledge and associated practices.

As a guide in the consideration of 'traditional' plant knowledge from gimmicks, and from the 'modern' plant knowledge the following inferences were made.

1. responses from a sample of persons supposedly influenced by global forces i.e. modernists (school pupils), were considered to comprise a knowledge that has considerable components of scientific botany, thus the 'global'. While responses from a sample of 'typical traditionalist' persons (kaya elders, healers, farmers, pole cutters, house builders, and carpenters) as being the potential 'traditional' Digo plant knowledge, thus the 'local', unless for some reasons doubted.
2. response from post school youths, were used as transitional stages of change, and also to give the predictions of the maintenance of 'modern' knowledge and its future potential in the society.
3. information that concurred between the majority of the traditionalist respondents was acceptable and considered common 'traditional' plant knowledge of the Digo. Also willingness of respondents to give answers, and answers that are given without much effort or strenuous thinking, combined with the high convergence of information, were

used as indicators of a ‘common’ knowledge. The degree of fluency and consistency of answers (in repetitive interviews) was used as indicator of mastery of the knowledge.

4. information and practices that were not shared was considered ‘specialized’ to the social group that present it.
5. for information that is characterised by disagreements, an explanation was sought towards the divergence. Either this indicated intra-diversity in the traditional plant knowledge, or some sources of information erred.

CHAPTER THREE
DIGO LINGUISTIC ASPECTS AND ETHNOPHYTOGRAPHY

3.1 INTRODUCTION

In this Chapter, an overview on linguistic aspects of the Digo (language history and semantics) is presented, and a discussion is made on ethnophytography of the Digo, focusing on the lexicon and descriptions related to plants and plant parts. The linguistic presentation is intended to allow the reader to follow the subsequent discussion, thus only the aspects enough for that purpose have been presented as it was not the objective of this study to develop a monograph of Chidigo. In the text summary overviews of the Digo linguistic aspects is given, which is supplemented by Appendix IV.

The Digo ethnophytography presented, both lexicon and descriptions of plant parts, were recorded from a wide range of respondents and have been compiled as a general plant knowledge to be commonly found among the Digo, unless otherwise stated. A major part of the discussion focuses on the higher plants (Plantae Kingdom), with some representation of lower plants including mushrooms (Fungi Kingdom). First the plant lexicon are presented and then followed by the descriptive terms. The arrangement of the lexicon for the plant parts is adopted from Berlin *et al.* (1974), which is based on groups of expressions, referring to stems, leaves, flowers, fruits and roots. The lexicon and descriptive terms of the parts are listed and then supplemented by explanatory comments. To begin with, the discussion makes considerations of Chidigo linguistic aspects. This followed by the Ethnophytography (General and special names of plant parts), including the descriptive terminologies.

3.2 A CONSIDERATION OF CHIDIGO LINGUISTIC ASPECTS

The language spoken by the Digo, Chidigo, is a Bantu language related to the Sabaki group (Proto-Sabaki) of languages. Generally, *Midzichenda* languages are quite similar to each other, and to a large extent mutually intelligible. Further more, *Midzichenda* and Swahili are close relatives within the Sabaki which is a branch of the North East-coast Bantu. The concept of a Sabaki branch which includes *Midzichenda*, Swahili, and Pokomo, has been introduced by Nurse and Hinnebusch (1993) and is backed by a number of regular phonological, grammatical, and lexical correspondences. These correspondences include plant names. Nurse

and Hinnebusch (1993) have also presented re-constructions at various levels, i.e., proto-Bantu and proto-Sabaki.

Chidigo has 5 vowels: a, e, i, o, u, pronounced as in Swahili (Nurse & Hinnebusch 1993), and 28 consonats, which are similar to those published by Dammann (1936) who worked on Digo folk tales in Tanga, Tanzania. In morphology, Chidigo like other Bantu is a class language, different from gender languages. The classes are organised in pairs and their relation is one of number. Chidigo has both primary and derived prefixes, and in its grammar the class system is characterized by verbal concord or agreement, i.e. the class membership of a given noun is repeated in dependant word categories such as adjective, verb and pronoun. For more details on historical and semantic aspects of Chidigo the reader is advised to confer Appendix IV.

3.3 DIGO ETHNOPHYTOGRAPHY

3.3.1 General names for plant part

The Digo perceive *muhi* [plant] to comprise of *kodza* [leaf], *muhi* [stem] and *muzi* [root], as a result *likosi* [algae], *koga* [moss], and *uoga* [fungi] are not typical plants, although they may be related to plants. In the following, an inventory of the general Digo lexicon of plant parts is presented with the English translation, and where possible re-constructions for common Bantu (CB) or/and proto-Sabaki (PSA) are indicated to note inherited terms. Although the labels are known to have either high or low tones, these details have been excluded here. The list of lexicon is followed by explanatory comments on related aspects.

Terms relative to the stem

DIGO	ENGLISH	CB	PSA
Muhi	stem, between base and first branch	ti (H)	muti
Sina	base of tree trunk, above ground	kina (HL)	ishina
Kolo	synonym for *sina*	kodo (HL)	ikolo
Gopha	bark	koba (HL)	mukoWa
Chironda	injury or scar on the bark	donda (LL)	kilonda (cf. ‘sore’)
Chilingo	A ring made (by removing bark) around the stem		
Nyere	appendages on the bark	-	-
Nyama za muhi	wood grains	yama (LL)	- (cf. ‘meat’)

Chiini	heart wood	-		
Bacha	soft wood	-		
Panda	branch	panda (HL)	-	(cf. 'fork')
Pindi	section between internodes	pindi (HH)	-	(cf. 'shin')
Pindi	a cassava tuber	-		
Gutu	a bulge on stem	-		
Pango	a hole in a stem	pango (HL)	-	(cf. 'cave')

COMMENTS

Muhi

The term *muhi*, is commonly used to refer to the stem (Fig. 3.1), the part between the basal part of the stem to the first branch. However, the term has considerable polysemy, i.e., has a very broad range of applications and meanings, which include a tree and a pole. The term *muhi* means 'tree' in all Bantu languages. *Muhi* consists of *sina*, the basal part of the stem (Fig. 3.1), which has a synonym - *kolo*. The prerequisite of *muhi* to have a *sina* or *kolo* disqualifies some scientifically accepted 'stems' in the category *muhi*, e.g., underground stems (stem tuber and rhizomes) are thus not recognised as *mihi*. Both *sina* and *kolo* trace their origin to the common Bantu terminologies. The basal part of the stem is perceived to have 'ancestral' connotations for the aerial parts of the plant, a derivation that is applied to human relationships. In metaphorical references the terms *sina* and *kolo* refer to the 'ancestral person' or 'place of birth' in human situation.

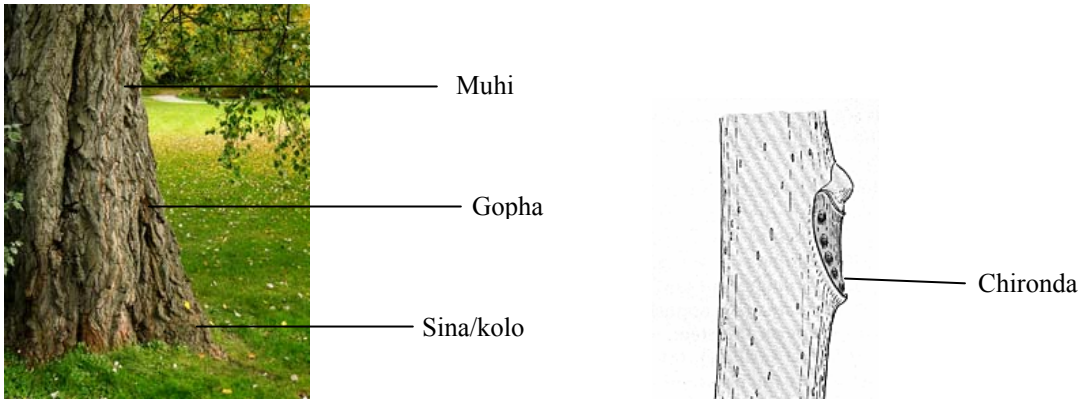


Fig. 3.1: The parts of a stem in a tree (right), and a sketch of an injury on a stem (left), labelled in their Digo equivalent terms.

Gopha

Muhi [stem] has a part known as *gopha* [bark] (Fig. 3.1), which traces its origin to the common Bantu word *koba*. The term *gopha* is used in everyday conversation to refer to

'wound cover' in humans. Following the application of *gopha* to human life situation, there has been a reciprocate transfer to plants, where an injury or scar on the bark of the tree (Fig. 3.1) is known as *chironda* [wound]. The term *chironda* is also traceable to the common Bantu (*donda*) and proto-Sabaki (*kilonda*), but then referred to wound and damaged tissue in humans and other animals. The application of the terms *gopha* [wound cover] and *chironda* [wound] to the 'bark' in plants and 'skin' in humans, suggests that the Digo consider the bark and the skin as equivalent structures in different organisms. This is further supported by the reference of appendage growths e.g. lichens on the bark of a plant, as *nyere* [hair]. The etymology of *nyere* is unknown, and seems to be new in Digo, most likely is borrowed from Swahili – *nyele*. To kill the plant, a Digo farmer strip off the bark around the entire perimeter of the stem, a process referred to as *kupiga chilingo* [stripping].

Nyama za muhi

The inner wood of a plant is known as *nyama za muhi* [wood grains], an expression that translates to 'meat of a tree'. The reference of wood grains as 'meat' stems from structural resemblance of the grains to meat chunks, and from the understanding that *nyama* is the internal content of every organism. Thus there are other plant parts referred to as 'meat' e.g. coconut and mushroom flesh, but these are discussed in their respective sections.

With reference to quality, *nyama za muhi* can either be *chiini* [heart wood] at the centre portion of stem, or *bacha* [soft wood] on the periphery. Only species that undergo secondary growth exhibit *chiini*, and is preferred for carpentry and for building purposes due to its durability (Pakia 2000). *Bacha* is prone to damage by pests, thus less preferred in carpentry and building. The etymology of *chiini* is 'purity', but its relation the 'heart wood' in plants is not clear. The etymology of *bacha* is unknown. The terms *chiini* and *bacha* are common among timber users (carpenters, pole cutters, house builders) but are not part of a general Digo plant knowledge.

Panda

Panda [branch] refers to a shoot from the *muhi* or a Y-shaped junction of branching. The etymology of *panda* is 'to climb', and also refers to catapult, focusing on the Y-shaped branch which is used in making the catapult. For all these meanings, the Digo share the term *panda* with the Swahili, and evidence shows that it is a common Bantu term. When a branch is cut, the resulting knob is known as *gutu*, a term also applicable to severed human body parts of e.g. amputated hand or leg. If a hollow develops at the knob or in the middle of the stem,

which is common in *Muhuhu* [*Brachylaena huillensis*], the hole is known as *pango*. However, *pango* also refers to a cave or hole in general, thus the term is not restricted to plant parts.

Pindi

This term refers to the section between two internodes e.g. in sugar cane stem, and also to cassava root tubers. It is surprising that a stem and a root, which are locally understood to be different as well, are identified with the same form. There was no explanation given for this labelling criterion, but it is probably a 'numerical' term (used in counting) rather than a label for a plant part. This assumption is supported by the fact that finger segments, commonly used to facilitate counting, are also known as '*pindi*'.

Terms relative to the leaf

DIGO	ENGLISH	CB	PSA
Kodza	leaf	*janį* (cf. leaf)	(*kodza* is shared among all *Midzichenda*)
Mishipa ya kodza	leaf veins	*kįpa* (LL)	*mushįpa* (cf. vein, artery, tendon)
Mongo wa kodza	mid rib	*gongo* (LL)	*mugongo* (cf. back, backbone)
Lutsa	leaf apex	-	
Mlita	leaf petiole	-	
Mala ga kodza	leaf lobes	*yada* (HH)	*kyala* (cf. finger)

COMMENTS

Kodza

The etymology for *kodza* [leaf] is unknown, but it is a common label for leaf in *Midzcichenda* languages, referring to the leaf (Fig. 3.2), thus suggesting its a regional lexicon. The Swahili however, refer to the leaf as *jani*, and apparently it is the Swahili who have maintained the original CB label for leaf. Thus *kodza* is only a proto-*Midzichenda* label, but not proto-Bantu term. The term *kodza* differs slightly from the scientific equivalent i.e. leaf, as *kodza* excludes some scientifically defined 'leaves' e.g. leaf bracts of Bougainvillea (for being colourful) (Fig. 3.2), seed leaves (cotyledons), spines and tendrils, (for their significant structural variation from the 'ideal' leaf). To the Digo, the function of *kodza* is protective, and is described as *nguo* [clothing] for the plant, protecting it from the hot sun. Thus, when deciduous trees shed off their leaves in the dry season, the Digo explain it as '*inabadilisha nguo*' [is changing cloth]. Also *makodza* are indicators of the vigour and good health of plants.

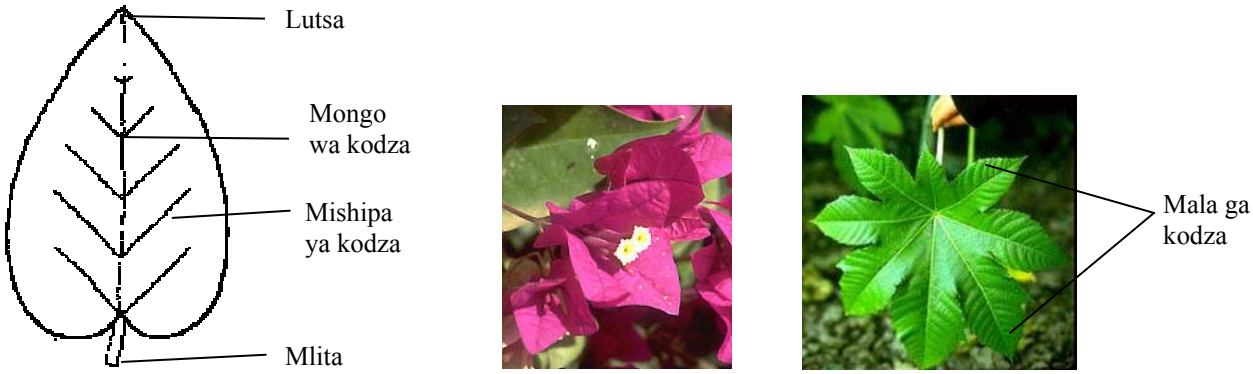


Fig. 3.2: Basic leaf parts (right) labelled in their Digo equivalent terms, Bougainvillea colourful bracts (middle), and a palmate leaf that shows *mala ga kodza* [fingers of a leaf]

Mishipa ya kodza

The label *mishipa ya kodza* [leaf veins] (Fig. 3.2) derives its name from structural and functional resemblance to human veins [*mishipa*]. The term *mishipa* is traceable to CB (*kipa*) and PSA (*mushipa*), but then referring to only the human parts. Thus the label '*mishipa ya kodza*' is a recent innovation, but it matches the English label 'leaf veins', referring to the same plant parts and possible from a similar perception.

Mongo wa kodza

The label *mongo wa kodza* [mid-rib], translates to 'spinal cord of leaf', and derives its name from its strategic positioning on the leaf (spinal) and its structural resemblance to human spinal column [*mongo*]. The term *mongo* is traceable to CB (*gongo*) and PSA (*mugongo*), but its application to plant labelling is a new observation.

Lutsa

The etymology of *lutsa* [leaf apex] is 'sharp end', and it traces its origin from the sharp leaf apices. There is no record of a separate label for rounded and truncate apices (not sharp), thus it can not be immediately said if such apices would have a different label or share this label.

Mlita

The term *mlita* [leaf petiole], is also used to refer to the stalk of a fruit and a flower, which suggests that *mlita* has structural connotations. However, the etymology of *mlita* is unknown.

Mala ga kodza

The Digo consider each leaflet (pinna) in a compound leaf (pinnate and bipinnate) e.g. in *Afzelia quanzensis* and in *Parkia filicoidea* respectively, as independent *kodza* [leaf]. The same description is also made for leaflets in digitate compound leaves e.g. *Vitex* spp. and *Lannea* spp. But leaf lobes in simple palmate leaves (Fig. 3.2) e.g. in cassava plant, are known as *mala ga kodza* [leaf fingers]. The reference of leaf lobes as *mala* [fingers] is partly based on the digitate (5 numerical) of the lobes and on the palm-like structure of the lobbed leaf. However, the application of *mala* for other plant parts (cf. banana fruits) suggest that the label is not specifically a reference for plant parts, and it is possible that it has numerical connotations. The term *chala* is traceable to CB (*yada*) and PSA (*kyala*).

Terms relative to the root

DIGO	ENGLISH	CB	PSA	
Muzi	root	*di*	-	
Chiazi	root tuber	-	-	
Pingu	root nodules	*pingu*		(cf. charm, fetters)
Ngamba	buttress	-		-
Ngao	synonym for *ngamba*	*gabo*		*igaWo* (cf. shield)
Misipha ya mizi	synonym for *ngamba*			

COMMENTS

Muzi

The term *muzi* [root] goes back to CB and PSA (*di*) terminology, but has been modified, although the referent still remains as roots (Fig. 3.3). In metaphorical language *mizi* (pl.) refers to a 'stability' or permanency. Thus the phrase '*akachita mizi*' [has established root], means one has established a permanent position. The internal fibrous structures in the middle of the cassava tubers are also known as *mizi*.

The Digo understand plants as living organisms that feed on 'soil' and drink 'water' via *mizi* [roots]. Thus the roots were described as *mromo* [mouth] of the plants. However, this descriptive label was given by the elderly Digo to elaborate the explanations of feeding in plants. Otherwise it is not a general label identified with the root.

Fig. 3.3: Root nodules in a leguminous plant (left), and buttresses in a tree (right) labelled in their Digo equivalent terms.

Chiazi

Root tubers are labelled with names of their respective species e.g. *manga* [cassava], *myogwe* [sweet potato] and *nduma* [arrowroot]. However, a relatively new root tuber plant, irish potato is known as *viazi* (pl.), and the label also refers to wild root tubers in general, putting together a variety of species that are not identified with a specific name. *Chiazi*, therefore, is a collective term for root tubers, and the irish potato is labelled with this general term because it is 'new' and lacks a specific name. The reference of internal fibrous structures in cassava tuber as *mizi* (cf. above) indicates that root tubers are more inclusive plant part, and *muzi* is only a sub-part of the tuber. In other words, *mizi* [roots] are sub-parts of *viazi* [root tubers].

To regard stem tubers (sweet and irish potatoes) as plant parts related to *mizi* suggests that the Digo consider underground plant part as *muzi* [root], which would thus include stem tubers, such as stolons and rhizomes. The Digo in this consideration deviate from science, where these parts are viewed as stems.

Pingu

Pingu [root nodules] refer to nitrogen assimilation structures in the roots of Leguminous and other plants [Fig. 3.3]. The term *pingu* also refers to a magical charm, a meaning that goes back to CB for charms. Most likely the root nodules were labelled after the charms due to structural resemblance. But the transfer to plant life situation led to a 'new' use for the root nodule, i.e. making the charms, thus applying the doctrine of 'signatures of symbols' postulated by Paracelsus (1490-1541) (Thomson 1978). The Digo use root nodules of *Ndago* [*Kyllinga* or *Cyperus* spp.] to make a charm that induces magical strength at a time of danger.

Ngamba

Ngamba refers to buttress (Fig. 3.3), but its etymology is unknown. However, its synonym *ngao* means 'shield' and this meaning goes back to CB. On the other hand *mishipa ya mizi*

means the 'neck of the roots', which simulates the buttress to the human neck. This was supported by an argument that a tree is like a human being positioned head down. Generally buttresses are understood to develop in trees that grow on a rocky soils hence develop shallow roots, as additional support and protection for the tree against forces such as winds. Thus the label *ngao* [shield] is viewed on structural (flat) and functional (protective) connotations. Although the Digo perception in buttress development differs from the scientific view, the synonym *misipha ya mizi* [neck of the roots], which describes the buttress as part of root concurs with scientific understanding.

Terms relative to the flower

DIGO	ENGLISH	CB	PSA
Ruwa	flower	*duba*	*įluwa*
Punga	male inflorescence of maize	-	*mpunga* (cf. rice plant)
Mwana	female inflorescence of maize	-	-
Chowa	young female inflorescence of maize	-	-
Thamra	synonym for *punga*	-	-
Njiyo	stigmas of maize inflorescence	-	-
Viapha	petals and sepals	-	-
Vishale	stamens and filaments	-	-

COMMENTS

Ruwa

The label *ruwa* [flower] goes back to CB (*duba*) and PSA (*luwa*), only slightly modified. The original PSA label, i.e. *luwa*, reappears in fixed labels such as *Chiluwa* [*Mkilua fragrans*] which bases its naming to the flower. *Ruwa* is understood to have structural feature (colourful) and functional feature (reproductive) i.e. from which fruits are produced. Based on the structural qualification *ruwa* includes colourful bracts of Bougainvillea, which are scientific described as 'leaves'. And based on functional qualification, *ruwa* includes *chowa* [female inflorescence of maize plant], but excludes *punga* [male inflorescence of maize plant] because the latter neither produces fruits nor is it colourful (Fig. 3.4). Surprisingly, male flower of papaya is labelled as *ruwa*, even though it does not produce fruits (a functional disqualification). Assumingly, the colourful appearance of the male papaya flower (structural qualification) and its close resemblance to the female papaya flower led to its inclusion into the *ruwa* category. Therefore, one can conclude that *ruwa* is a plant part that is either

colourful or produce fruits, or both, which does not concur with the scientific definition of 'flower'.

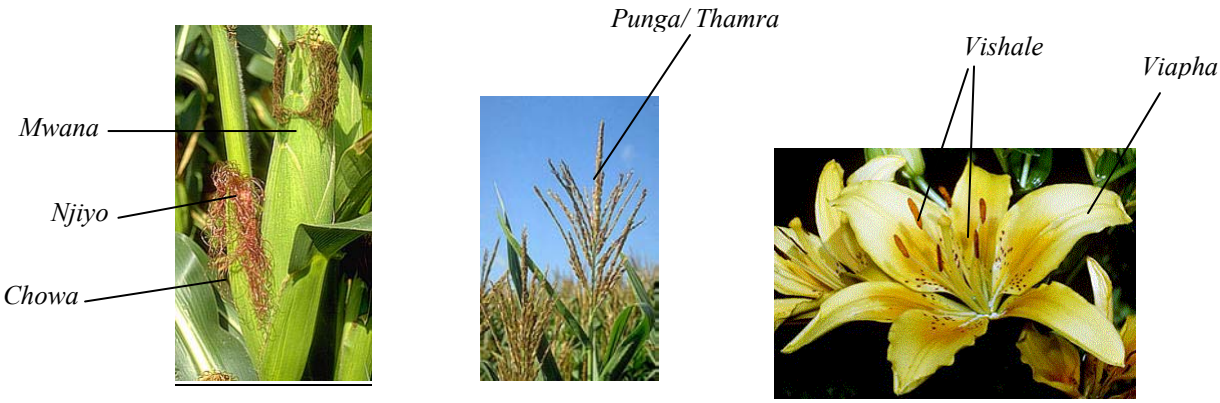


Fig. 3.4: Maize plant flowers, the female inflorescence/fruit (left) and the male inflorescence (middle), and a bisexual flower with visible stamens, pistil and petals (right), all labelled in their Digo equivalent terms.

Punga

The plant part *punga* is the male inflorescence of maize (Fig. 3.4), but the Digo understand it as an indicator of the maturity of the corn, i.e. when it dries the corn is mature and ready for harvesting. From a general perspective, *punga* also refers to panicle structures in grasses e.g. *Panicum maximum*, sugarcane [*Saccharum officinarum*] and the florets in a coconut inflorescence. Mwalimu Mwakatengo, from Kinondo, was the only respondent who gave a synonym for *punga*, i.e. *thamra*, but he also knew the term *punga* for the same part. In follow up discussions, the term *thamra* was noted to be unknown among the Digo. It is assumed that *thamra* is a loan word from Swahili or from Tanzanian languages. On the other hand, *punga* seem to be a modification of *mphunga* [rice] which has similar reproductive structure, but the latter is an older term (PSA) for rice.

Njiyo

Generally, the parts of a flower (petals, sepals, anther, and stigma) are not lexicalised in Digo. Occasionally there were invented responses e.g. *viapha* [small wings] for petals and sepals, and *vishale* [small arrows] for stamens and filaments (Fig. 3.4), probably as respondents try to be polite. But in general, these responses were neither common nor consistent to be considered genuine. Despite this observation, some labels for flower parts were common and are genuine. These include *njiyo* [stigma of maize flower] (Fig. 3.4), which is a homonym for a colourful decorative attire of traditional dancers. The colourfulness and the free hanging posture of the two led to the homonym whose etymology is unknown.

Terms relative to the fruit

DIGO	ENGLISH	CB	PSA
Tunda	fruit	-	*ịtunda*
Gada	skin (exocarp) of fruit and rind of root tuber		-
Sufi	kapok, woolly fruits	-	-
Pamba	cotton, woolly fruits	-	-
Tembe	seed	-	-
Chitsa	embryo (maize, mango, bean, pea)	-	-
Mwezi	cotyledons of mango seed	-	*jedị* (cf. moon)
Mwezi	embryo in coconut seed	-	-
Dzitso	scar (hilum) in bean seed, scars in coconut seed, eye bud in irish potato		
Mbeyu	propagation material	*begu/ beyu*	- (cf. seed)

COMMENTS

Tunda

The term *tunda* [fruit] is restricted to fleshy fruits (berry, drupe, pome, and hesperidium), excludes dry dehiscent fruits (follicle, legume and capsule) and dry indehiscent fruits (caryopsis, achenes and nuts). Although all plant parts that develop from flower are supposed to be fruits, respondents were hesitant to include maize corn, groundnut, bean pod, cow pea pods, among others, in to the *tunda* category. Thus *tunda* as fruit category excludes some scientifically defined fruits.

Although the etymology of *tunda* is unknown in Digo, the term is common and always refers to fruit (or a sub-set of fruits). The meaning of *tunda* was most likely lost in the history of the language as evidence shows that this term is regional, shared with the Swahili, and is traceable to PSA. The cover of both fruits and seeds, as well as the rind of root tubers is known as *gada* [skin], the exocarp.

Some fruit types have specific labels, e.g. *sufi* [kapok] (Fig. 3.5) and *pamba* [cotton] which refer to woolly fruits of domesticated plants as well as woolly fruit producing plants in the wild e.g. *Msufi mwitu* [*Bombax rhognaphalon*] and *Pamba mwitu* (*Gossypoides kirkii*]. The terms *sufi* and *pamba* are most likely loan words of Arabic and Persian origin (respectively), loaned via Swahili. Winged structures in the fruits e.g. in *Gyrocarpus americanus* (Fig. 3.5) and *Combretum schumannii*, are known as *mapha* [wings]. The labelling of these plant parts

after ‘wings’ is based on structural similarities, however, the genuineness of the labels could not be immediately established as the respective species were not common in some areas of study.

Fig. 3.5: Woolly fruits of kopak tree i.e. *Ceiba pentandra* (left), and of cotton i.e. *Gossypium* sp. (middle), and winged fruits of *Gyrocarpus americanus* (right).

Tembe

In some fruits there are *tembe* [kernels or seeds]. The term *tembe* also refers to grains in general e.g. *tembe ya mtsanga* [soil particle] and *tembe ya tsere* [maize grain]. Seemingly, *tembe* is a structural label for grain, and not restricted to seed *per se*. The historical (CB) label for seed is *begu ~ mbeyu*, but most Digo today prefer the term *tembe*. This term is probably a loan word from Swahili. On the other hand, the term *mbeyu* has broader meanings (cf. Chapter 7) that include propagule, and is of a functional label rather than a label for a specific plant part.

Chitsa

The term *chitsa* [embryo] refers to embryo in most seeds where it is observable with unaided eye, e.g. in maize, bean, mango (Fig. 3.6a). But in the coconut seed the embryo is known as *mwezi*. The etymology of *chitsa* is unknown, but the plant part is understood as the source of the ‘next’ plant, and so is the *mwezi* in coconut seed. The etymology of *mwezi* is moon. The basis of labelling the coconut seed embryo as *mwezi* is likely to be the structural resemblance between the embryo and ‘full moon’. *Mwezi* also refers to the cotyledon of mango seed (Fig. 3.6b), which resembles half-moon, and probably the bases of its labelling.

Dzitso

A mark on the seed, as in the bean seed, is known as *dzitso* [hilum], which is the scar of attachment to the fruit (Fig. 3.6c). The etymology of *dzitso* is ‘eye’, and is applied to the three scars on a coconut seed and the eye buds of irish potato as well. *Dzitso* seems to be a

structural label, for fruit or seed parts where the new shoot comes out. The label also concurs with other speakers e.g. the English label ‘eye buds’.

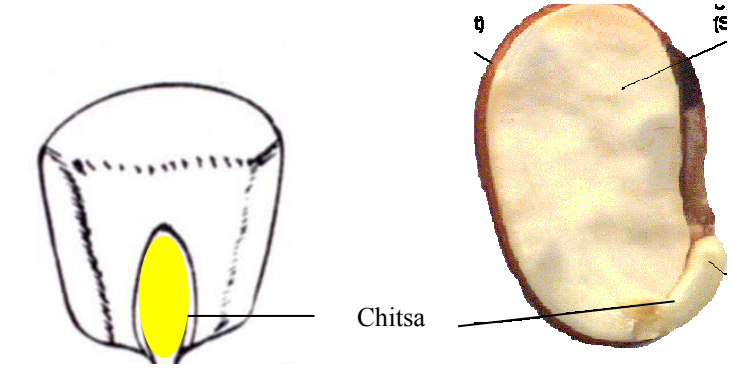


Fig. 3.6a: The embryo [*chitsa*] in maize and bean seeds

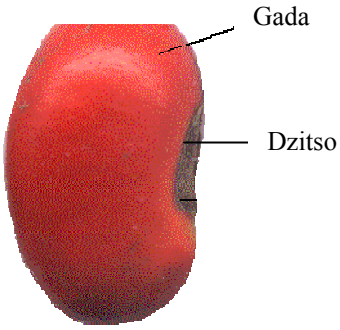
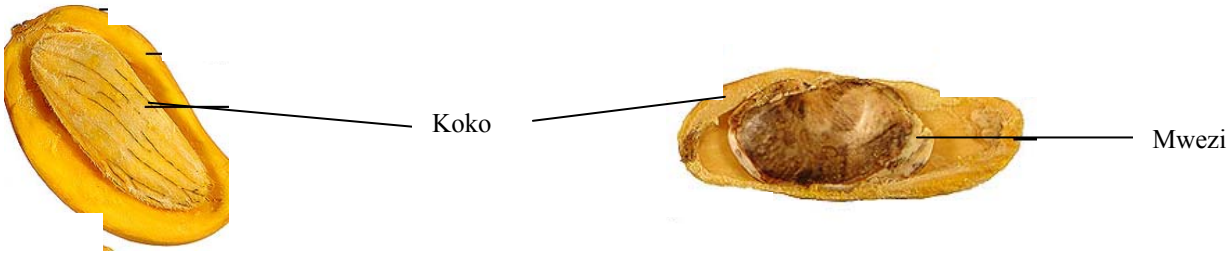


Fig. 3.6c: Helium and exocarp in bean seed labeled in Digo



Fig, 3.6b: The seed (left) and the embryo (right) in a mango fruit

Lexicon for exudates

Some plants produce exudates, which the Digo distinguish with reference to the use or effects to humans. Although each exudates is labelled and described, there is no collective term equivalent to ‘exudates’. There are six types of exudates that are identified and labelled in Digo, as follows:

DIGO	ENGLISH	CB	PSA
Maziya	milk latex (harmless)	*dịba*	- (cf. milk)
Maronvi	caustic and toxic oil	-	-
Ukaka	sticky latex	-	-
Gamu	sticky resinous sap	-	-
Ulimbo	burning or itching latex	*dimb* (cf. stick to)	*wulimbo* (cf. bird lime)
Utsungu	toxic latex	*cungu*	*wucungu* (cf. gall, bitterness) *cungu* (cf. bitter)

COMMENTS

Maziya

The term *maziya* has the etymology ‘milk’, and goes back to CB for the same meaning. Today the term also refers to latex produced by *Euphorbia hirta* (a medicinal latex); *Hunteria zeylanica*

and *Suregada zanzibariensis* (latex has no known use); and *Ficus* spp. (latex used to fix feathers in arrow shaft). Thus *maziya* is a milk-like exudate that is either useful or not, but generally not harmful. Even the milky fluid produced by seeds e.g. maize, in the milky stage of development is referred with the same term - *maziya*, and its presence indicates immaturity.

Maronvi

The exudate *maronvi* [caustic and toxic sap] is produced by the cashew nut fruits at immature stage [*dunje*] and from the outer cover of mature cashew nuts. The caustic and toxic character of this sap is known to the Digo, hence take precaution and avoid contact. The etymology of *maronvi* is unknown, but is among the exudates learnt from early childhood due to the domestication and commercial value of cashew nut to the Digo.

Ukaka

The exudate *ukaka* [sticky latex] is produced by *Saba comorensis* and *Landolphia kirkii*, and is used by Digo youth to make an adhesive trap for birds. Its etymological meaning is unknown.

Gamu

The exudate *gamu* [sticky resinous sap] is produced from the bark of cashew tree, and its adhesive features are used for sticking objects on a given surface. The Digo label for this sap is a loan from English 'gum', based on the sticky features and general applications which are shared.

Ulimbo

The exudate *ulimbo* [burning or itching latex] is produced by plant species such as *Euphorbia nyikae* and *Synadenium pereskiifolia*. This latex is understood to adversely affect the skin and eyes on contact, hence it is avoided. Some people use it as a fish poison. Although the label is closely identical to the terms *dimb* (CB) and *wulimbo* (PSA), the meanings are not. The 'old' words refer to 'sticky latex and bird lime', which concur with *ukaka* in 'today' Digo.

Utsungu

The exudate *utsungu* [toxic latex] is produced by *Acokanthera schimperi*, and is understood to be lethally poisonous, both orally and intravenously. Due to this property, *utsungu* is used as an arrow poison. The etymology of *utsungu* is 'bitterness', which goes back to CB (*cungu*) and PSA (*cungu* or *Wucungu*), where the terms also referred to gall. *Utsungu* also means poisonous substances, seemingly the bases of the labelling. However, *Acokanthera schimperi* (the source of

the exudates) is relatively new at the Kenya Coast, introduced by the Giriama (Beentje 1994) for the use of making arrow poison, thus the application of *utsungu* to the exudates is relatively new.

3.3.2 Special lexicon for plant parts in specific species

The lexicon presented above consists of general labels that are applicable to most plant species. However, in addition to these, there are labels for plant parts in specific species or group of related species, as indicated in the following sections. The discussion is organised on the basis of species of interest, and a list of the special lexicon for each species is presented, then followed by explanatory comments on related aspects. As earlier, English translation or equivalent, common Bantu (CB) and proto-Sabaki (PSA) terms are also given where possible.

The coconut tree

DIGO	ENGLISH	CB	PSA
Kuti	leaf	-	*įkuti* (cf. coconut leaf)
Mbati	mid-rib of leaf	-	-
Kumbi	leaf petiole	-	-
Kumbi	exocarp of coconut fruit	-	-
Makalala	fronds	-	*ndlala* (cf. palm frond part)
Ukuti	spine of the frond	-	*kuti*
Ndifu	coir	-	-
Phanda	flower of coconut tree	-	-
Punga	florets of coconut flower	-	*mpunga* (cf. rice plant)
Chendze	fruit stalks of coconut flower	-	-
Phalanga	cover of inflorescence	-	-
Kolokotsi, *daka, tale*	young stages of fruit	-	-
Dafu, koroma	middle stages of fruit	-	-
Nazi, nguta	mature stages of fruit	-	-
Chivo	endocarp	-	-
Uwi	coconut milk	-	-
Madzi	coconut juice (liquid endosperm)	*ji*	*maji* (cf. water)
Nazi	coconut meat (solid endosperm)	-	
Mlala	young palms (of palmate leaves)	-	
Bangalala	leaf in mature palms (of palmate leaves)	-	

COMMENTS

Kuti

Although leaves are generally known as *makodza*, the leaf of a coconut tree is commonly known as *kuti* (Fig. 3.7). Like *kodza*, the etymology of *kuti* is unknown, but the term goes back to PSA (*ikuti*), referring to the same plant part. Application of the term *kuti* is used relatively less in reference to other pinnate palm leaves (whose leaflets share a clearly visible midrib), e.g. Phoenix and Raphia. For other closely resembling leaves of Cycads e.g. *Encephalartos hildebrandtii*, the term is not used at all. The remote application of the term to some palm leaves and complete exclusion for cycad leaves is based on both structural differences with, and functional divergence from, the coconut leaves. From the *kuti*, domestic items such as *vyungo* (plaited roofing material[1]), *kandza* (woven mat), and *liphyero* (broom), are made. Similar items from other palm species have an inferior quality compared to those from the coconut leaf; and cycads are never used for making these items.

Parts of the *kuti* are also identified by specific names (Fig. 3.7). *Makalala* (interchangeable with *mikalala*) refers to the leaflets, i.e. fronds, a label that goes back to PSA, *ndlala*. The label *makalala* probably originates from a noise the fronds make with wind effect. The mid–rib of the *kuti* is known as *mbati*. The etymology of *mbati* is unknown, but the plant part is used in making *vyungo* [plaited roofing material] and *mbano* [sticks for smoking fish]. The mid-rib of the fronds are *mikuti* (*ukuti* - singl.). Like *mbati*, the etymology of *ukuti* is unknown, but is traceable to PSA (*kuti*). *Mikuti* are used for making *liphyero* [broom] and *tsatsa* [fish traps] (Pakia 2000). The leaf petiole of *kuti* [the leaf] is *kumbi*, which is also a homonym for the exocarp of the coconut fruit. The etymology of *kumbi* is unknown, but is used for fire wood by commercial food vendors. *Ndifu* [fibrous material on petiole] is also a homonym for the coir. The fibrous material is used as a sieve, particularly in palm sap tapping, and the coir husk is used for washing utensils (as steel-wool). In recent times the coir husk is used for making floor rags and is also processed to coco-peat for horticultural soil mixtures.

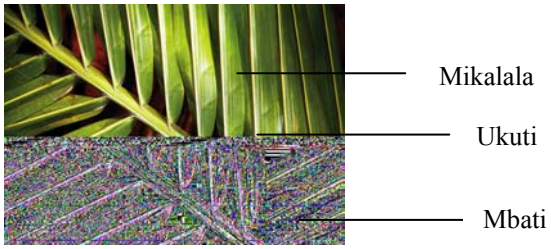


Fig. 3.7: Coconut leaf and its parts, labelled in their Digo terms

[1] *Vyungo* are made using plucked off fronds which are woven back onto the leaf stick [*mbati*] by tying each frond individually onto the stick, and making sure the tied fronds overlap such that water can not percolate.

Phanda

Phanda is the flower branch of the coconut tree and the term also means 'to sow', but a possible relationship between the two is not clear. Flower parts of the coconut tree, unlike in many other flowers, are labelled. These include: *chendze* [fruit stalks], *phalanga* [cover of the inflorescence], and *punga* [florets]. *Chendze* is used as a broom, and *phalanga* for firewood. The florets, *punga*, derive their name from their resemblance to rice panicle [*Mphunga*].

Nazi

The term *nazi* generally refers to the coconut fruit, but in strict sense it refers to the mature stage of the fruit, which is also the most useful stage. From *punga*, the coconut fruit develops through seven recognised stages (Fig. 3.8), which are listed below in sequence of their development:

- *Kolokotsi* - is the immature stage, very small, no fluid [*madzi*] or flesh [*nyama*] inside. The fruit at this stage is only used in magic related purposes.
- *Tale* - is still immature and small, but larger than *kolokotsi*, hardly with any fluid or flesh. This stage is also only useful in magic related purposes.
- *Daka* - is immature stage but large sized, with some fluid that is not sweet, and no flesh.
- *Dafu* - is a middle stage, has sweet fluid and shallow flesh, and is used for refreshment.
- *Koroma* - is an intermediate stage, the fluid is no longer sweet and the flesh is too hard for refreshing, but still too soft to produce *uwi* [coconut milk]. This coconut milk is different from that in the Western view, which is here referred to as the 'fluid' [*madzi*].
- *Nazi* - is the most useful stage from which the coconut milk, used for cooking and for making coconut oil, is obtained. Primarily the Digo grow coconut trees for the *nazi*.
- *Nguta* - is a late stage, which is mostly avoided by farmers. Locally, the flesh is chewed and is believed to be aphrodisiac. *Nguta* can be sold as copra for oil production.

Fig.3.8: Some of the stages of coconut fruits (right to left) – *punga*, *kolokotsi*, *daka*, *dafu*, *nazi* and *nguta*.

In addition to the elaborate stages, the parts of the coconut fruit are also labelled in great details (Fig. 3.9). As mentioned earlier, there are *kumbi* [exocarp] and *ndifu* [coir]. Other parts

are *chivo* [endocarp], the fruit shell commonly used for fuel, and in recent times it is used for making bracelets. *Nazi* is the flesh, *madzi* is the fluid and *mwezi* is the embryo.

Most lexicon for coconut plant the Digo share with the Swahili. These include fruit stages *daka, tale, dafu, koroma* and *nazi*, whose equivalents in Swahili are – *kidaka, kitale, dafu, koroma,* and *nazi*. The same applies to Digo labels *madzi* and *uwi* for Swahili *maji* and *tuwi*. Since the species was introduced, originally from South Asia (Maundu *et al.* 1999), possibly the Digo got it via the Swahili before it naturalised as native species at the Kenya coast (Beentje 1994). This assumption was, however, refuted by Abdallah Mnyedze, who claimed *kaya* Ganzoni was the first landing place of the coconut fruit afloat from India. He based his argument on historical accounts made by his fore-fathers.

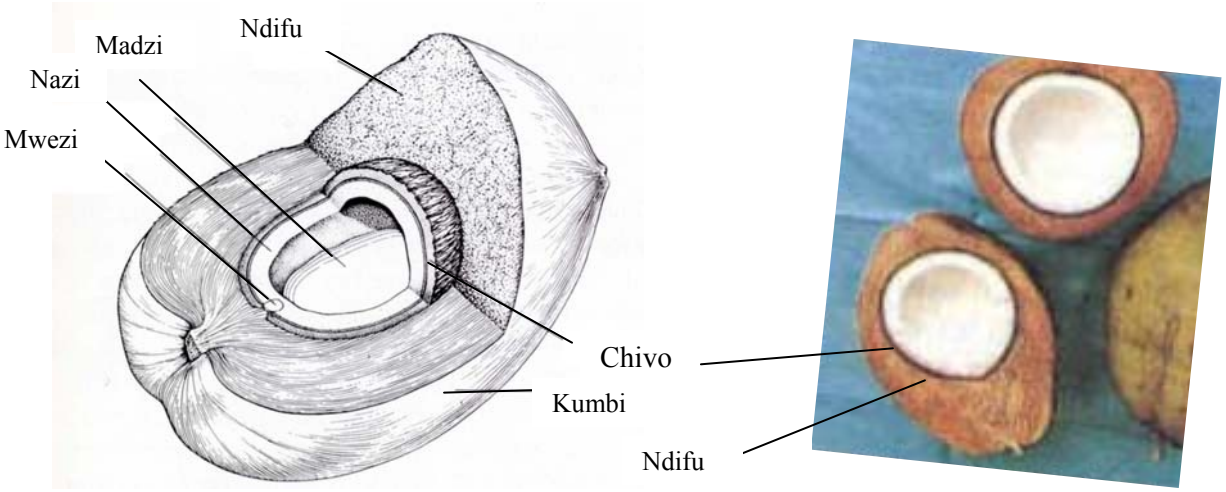


Fig. 3.9: A sketch diagram showing the interior parts of a coconut fruit (left), and a coconut split open (right)

Corresponding plant parts in other palm trees (Phoenix and Raphia) are only scarcely labelled with the lexicon of plant parts of coconut tree, and so is the application of utility values of those parts. When the labels are used for parts of the other palms, an indicative affix phrase is used e.g. '*ukuti wa uchindu*' [*ukuti* of Phoenix], which on the whole denotes the coconut tree (whose labels remain unmarked) as the prototype for the labels in those palms.

In contrast to the coconut and other pinnate leaf palms, palm trees with palmate leaflets (spirally arranged), such as in Borassus and the Doum palm (Hyphaene), the leaves are known as *mlala* (in young plants) and *bangalala* (in mature trees). The difference in the label for the different palm ages relate to utility. Leaves of the young plants are used for weaving mats, baskets, hats, etc, but not leaves of old trees of these palms. The etymology of *bangalala* is unknown, but *mlala* goes back to SPA (*mulala*), meaning 'dwarf palm', probably in reference to 'young palm' as noted in this study.

The banana plant

DIGO	ENGLISH	CB	PSA
Mgomba	banana plant	-	-
Gomba	pseudo-stem, leaf, flower bud	-	-
Ndizi	banana fruits	-	-
Chala cha ndizi	individual banana fruit	*yada*	*kyala* (cf. finger)
Tsana ya ndizi	bunch cluster of banana fruits	-	-
Mkungu wa ndizi	infruitescence	-	-

COMMENTS

Mgomba

Mgomba refers to the banana plant, which consists of *gomba* [pseudo-stem], and the term *gomba* is also used to refer to the leaf and to the flower bud (Fig. 3.10). In Digo, the etymology of *gomba* is 'to speak', and there is a clan known as '*Achina-gomba*'. However, there is no evidence connecting 'speaking' or the clan to the banana plant.

Fig.3.10: Parts of a banana plant. From left to right – A section of the banana plant, a flower bud of the banana plant, and infruitescence of banana, and a bunch of bananas

Ndizi

Ndizi refers to the banana fruits, which have a numerical label *mala* [fingers], i.e. *mala ga ndizi* [banana fingers]. The use of the numerical label *mala* here is similar to leaf lobes (described earlier). This numerical description is applied to similar looking fruits of wild species such as *Uvaria* spp. While a single banana fruit is considered as 'finger', a bunch cluster of bananas is *tsana* (Fig. 3.10); a term that also means 'comb'. It is not clear whether

tsana is a homonym for the banana bunch and the comb, or is polysemic for the two based on structural resemblance. Fruit Bunches for some other species are also labelled, e.g., *suche-ra-mphunga* [rice panicle], *shazi-ra-nazi* [coconut fruits tied together]; *dzitsa-ra-nazi* [coconut fruits in fruit stalks]; and *phutsa-ra-kunguma* [panicle of *Sorrindea* fruits]. The whole infruitescence of banana plant is *mkungu-wa-ndizi* (Fig. 3.10)

Linguistic comparison show similarities between Digo lexicon in banana plant with that of the Swahili, i.e. *mgomba, gomba, ndizi, chana* and *mkungu* (in Swa.). Despite these common lexical, the labels are not traceable to CB or SPA, and their etymology are unknown. This suggests the labels, like the banana plant itself, are new. It is very likely that the Digo received the labels with the plant via the Swahili.

The maize plant

DIGO	ENGLISH	CB	PSA
Tsere	maize plant, maize cob	*cede* (cf. clean)	*mucele* (cf. cleaned grain)
Chowa	female flower of maize plant	-	-
Punga	male flower of maize plant	-	*mpunga* (cf. rice plant)
Njiyo	stigmas of maize flower	-	-
Mguguta	hard axis of the maize cob	-	-

COMMENTS

Tsere refers to the maize plant as well as the cob. The label *tsere* goes back to CB (*cede*) and PSA (*mucele*), but these terms refered to ‘clean grain’. Since maize was introduced to the Digo by the Portuguese and the English (Waaijenberg 2000; Harrison 1970), the application of the term *tsere* on the maize must be relatively new, but using an old label – *mucele*. The modification from *mucele* to *tsere* allowed for the differentiation between *tsere* [maize] and *mtele* [cleaned rice seeds]. In its early development, *tsere* [cob] is known as *chowa* [young female inflorescence]. The etymology of *chowa* is ‘sheath’, a label used due to its functional similarities of this plant part (covering and protecting developing cob), with that of a knife-sheath (covering and protecting the knife inside).

The cassava plant

Manga	cassava plant
Manga	cassava tubers
Puli	fruit of cassava plant
Tembe ya manga	synonym to *puli*

COMMENTS

In Digo, fruits are commonly named after the mother plants e.g. *Mchungwa* (tree) and *Chungwa* (fruit). However, in cassava plant this is not the case, instead the root-tubers and rhizomes share a name with the plant. The fruits in cassava plant are known as *puli*, a term that also refers to earring. The cassava and other tuber plant examples suggest that in Digo the plant shares a name with the 'useful' part. While the cassava tubers are eaten, the fruits have no known use. Hence the tubers share the name *manga* with the plant. The label *puli*, for the fruits, was given by elderly Digo, whilst most young Digo referred to it as *tembe ya manga* [seed of cassava plant]. This labelling pattern was common among all speakers for fruits that are not used in wild species. For example, seeds of *Milicia excelsa* and *Hymenaea verrucosa* are referred to as *tembe za Mvure* and *tembe za Mtandarusi* respectively. But the timber of these species, because its useful (Pakia 2000; Beentje 1994) is referred with the respective species name.

3.3.3 Labels of plant parts in relation to cultural significance

Leaves that are not makodza

Dawa	medicine
Vwanda	leaf poultice
Nyungu	a bath pot (made with leaves)
Vuwo	synonym for *nyungu*
Maruwa	leaves in funeral ceremony
Mashada	leaves in a marriage ceremony

COMMENTS

In Digo social life, the label *kodza*, which commonly refer to leaf, changes from one occasion to another. As medicine, all plant parts are referred to as *dawa* [medicine], leaves inclusive. However, specific *dawa* has different label depending on the mode of preparation. *Vwanda*

[leaf poultice] is made by smashing the leaves, and *nyungu* or *vuwo* [bath pots] are shredded leaves in a 'medicinal' pot with water. Apart from *dawa*, the other medicinal labels for leaves are relatively technical, known mainly to healers and their assistants.

During a funeral ceremony, the body of the deceased is covered with a timber plunk. Gaps between the wood plunk and the dead body are covered with '*maruwa*' to protect soil from reaching the dead body. In a normal conversation *maruwa* refers to flowers, but in the funeral rites *maruwa* refers to leaves. The use of the term *mauwa* for leaves, as indicated here, probably signifies 'beauty' connotations associated with flowers, which in principle reflect affection to the deceased. Surprisingly, in this practice there are no efforts made to search for the true flowers [*maruwa*], and even when these are available in the vicinity, they are never used. Yet the label *maruwa*, for leaves, is synonymous and nobody mistakes the referent in that occasion.

During a wedding ceremony, the married man, friends and relatives use leaf decorations that are placed under their head caps. These decorations testify the occurrence of a wedding ceremony in an area. The leaves used in the wedding ceremony are known as *mashada*, and is usually a sensitive ceremony that one is penalised on referring to these leaves as *makodza*. However, it was not clear whether this practice was typical Digo or is borrowed from Swahili-Islam culture, as the practice is shared with the Swahili speakers. In addition, *mashada* is a loan word from Arabic *shahada* [declaration], which agrees with the objective of the decorations, i.e. to declare the wedding event.

Vegetables, leaves and fruits, are used as side dish [*mboga*] among the Digo, and are collectively referred to as *mtsunga*. The plant part used differs between the species, and individual species maintain their specific names, with only that specific part used as a vegetable referred to as *mtsunga*. For example, in cassava plant, it is only the young leaves which are used as vegetable and it is only these leaves that are labelled as *mtsunga*. However, there are some species which are used as vegetable that probably lost their specific names and are grossly identified as *mtsunga*, e.g. *Launea cornuta*. Further, *mtsunga* of some species is distinguished with specific names, e.g. *Mpeya* is leaf vegetable of cassava, and *Mtsafwe* is the leaf vegetable of cow pea.

Maruwa that are not flowers

Maruwa	ornamental plants (with or without flowers)
Maruwa	decorative drawings on hands and legs, and on *khanga* [cloth fabrics]
Maruwa	flower rosettes or other decorative items dressed in the hair
Maruwa	plaited patterns on the hair

COMMENTS

In addition to referring to leaves in funeral ceremony, *maruwa* also refers to plants for ornamentation, whether the plant is in flower or not. The term is used even for non-obviously flowering species e.g. *Casuarina equisitifolia*. The *ruwa* here refers to the 'ornamentation' of the plant, and not to the 'flower' as such.

Although the Digo do not communicate romantic emotions via flowers, such as in the Western culture, flowers are used affectionately in different ways. Flower drawings and other drawing patterns are preferred in fabrics to improve the 'beauty' for romantic attractions. Also, for the same reason, hair plaiting is done in patterns identified with flower names e.g. *chiluwa* (*Mkilua fragrans*). Drawings made on hands and legs using special ink (*piko*) or plant extract - *hina*, [*Lawsonia inermis*], for romantic attractions, are also known as *maruwa*. Flower rosettes of selected species (*Chiluwa* [*Mkilua fragrans*], *Mlangi-langi* [*Cananga odorata*], and *Asmini* [*Jasminum* sp.] are also as decorations on clothes, heads or beds for their beauty and fragrance. All these beautification elements, flowers or otherwise, collectively known as *maruwa*. In other words, *ruwa* in Digo has a concept of beauty, which is understood as a prerequisite of romantic attraction.

3.3.4 Descriptive terms for plant parts and characters

General descriptive terms

Colour terms

DIGO	ENGLISH	CB	PSA
Nyiru	black (darker shades)	*yịdu*	-
Ny*ereru*	white (lighter shades)	*yedu*	-
kundu	red	*kundu*	-
Itsi	unripe, green, uncooked	*bici*	-

Rangi ya nyasi	grass colour (for green)	*yatiį* (cf. grass)	-
Chirere cha mgomba	young banana leaf (for pale green)	-	-
Chijani	leaf (for green)	*janį* (cf. leaf)	-

COMMENTS

The colour terms commonly used in plant descriptions are *nyiru* [black]*, nyereru* [white] and *kundu* [red], which are the 'basic colour terms' (Berlin & Kay 1969), and trace their origin to CB (*yidu, yedu* and *kundu* respectively). The term *nyiiru* on the whole translates as black, but in the plant context it mostly correspond to English 'green' and is estimated to indicate a plant of good vigour. Occasionally maize seedlings develop whitish leaves, described as *mereru* [white], and are understood to reflect a poor vigour of the plant, i.e., the contrast of '*maru*'. Such seedlings are usually weeded. A dead leaf is referred to as *kodza rakundu* [red leaf], but this covers a range of colours such as red, orange, yellow and brown. The above general colour identities and descriptions are applicable to all plant parts (leaves, fruits, stems, flowers, roots etc), with the basic colours prominently featuring in plant description. However, there is a colour term restructuring pattern that is going on among the Digo speakers, details of which are discussed in Chapter 9 of this thesis.

In addition to the basic colour terms, the Digo have derived colour terms such as the transfers *itsi* [unripe], *rangi ya nyasi* [grass] and *chirere cha mgomba* [young banana leaf]. There are also borrowed colour term *chijani* (from Swahili *kijani*) and *griini* (from English green).

Size terms

DIGO	ENGLISH	CB	PSA
Kulu	large size	*kudu*	-
Dide	small size	-	-
Refu	long	*deepų*	-
Fupi	short	*kųpį*	-
Pana	wide	-	-
Dzembamba	thin	-	-
Zito	thick or succulent	*dįtu* (cf. heavy)	-

COMMENTS

Size of plant parts is described as *kulu* [large] or *dide* [small] but only comparatively within and between species. These are also the general labels denoting size categories everything in

life. Surprisingly, only *kulu* traces its origin to CB (*kudu*), and *dide* seems to be an innovation. The length of a plant part is described as *refu* (long) or *fupi* (short), both shared with Swahili and traceable to CB (*deepų* and *kųpį* respectively). The term *zito* refers to thick or succulent parts e.g. Aloe leaves, and concurs with the CB term *dįtu* for 'heavy'. The terms *pana* [broad] and *dzembamba* [thin] describe the breadth, and are most likely loan words from Swahili.

Form descriptions

DIGO	ENGLISH	CB	PSA
Nyooka	straight	*yįnuk* (cf. straighten)	-
Panda	branched	*panda* (cf. forked)	-

Plant parts commonly described by form or shape are trunks and branches, and the terms used are *nyooka* [straight] and *panda* [branched], which are traceable to CB. Occasionally roots and leaves are also described using these terms. Some form descriptive terms are specific to leaves (cf. 'leaf section').

Maturity terms

Tsanga	immature stage
Pevu	mature stage
Tosa	just about to ripe (ready tomorrow)
Ivu	ripe

COMMENTS

Maturation in plant parts is described as *tsanga* [young] and *pevu* [mature], which are important for plant collectors e.g. vegetable gatherers normally go for only the 'young leaves' [*makodza matsanga*], while fruit collectors go for *pevu* [mature]. These labels apply to all plant parts. However, fruits that are eaten raw, e.g. mango, pawpaw, and banana, have additional maturation descriptive terms, i.e., *tosa* [ready for tomorrow] and *ivu* [ripe]. Except for the term *tsanga*, which is also applicable to humans, the other maturation terms (*pevu*, *tosa* and *ivu*) are strictly plant related. The etymologies of all these terms are unknown, neither are they traceable to 'old' vocabulary, but they are regional, shared even with the Swahili. It is not clear what the source of these terms are.

Water content descriptions

Itsi	fresh	*bici* (in common Bantu)
Kavu	dry	-

COMMENTS

Water content of a plant part is sometimes indirectly recognizable by its colour. *Itsi* [wet] refers to a green part, which commonly has high water content, while *kavu* [dry] refers to a dead plant part that is more or less dry. However, the term *itsi* has a considerable polysemy, as it also refers to 'uncooked' stuff (for materials that are utilised after cooking), 'fresh' items and 'early' periods of time. In normal conversation, therefore, *itsi* can be used to characterize a fresh thing or person, and could be applied to first stages of a period.

Smell and taste descriptions

DIGO	ENGLISH	CB	PSA
Nuka to	good smell	*nụụk* (cf. smell)	-
Nuka vibaya	bad smell	*nụụk* (cf. smell)	-
Mtswano	sweet	-	-
Utsungu	bitter	*cungu*	*cungu* (cf. bitter)
Kakasi	sour	-	-

COMMENTS

Both smell and taste have minimal verbalised descriptive labels. Smell is generally known as *nuka*, modified from the original CB term *nụụk*. The term '*nuka to*' means good smell, and *nuka vibaya* means bad smell. As for taste, except for *utsungu* which means bitter taste, and traces its origin from CB *cungu*, the other taste descriptions, *mtswano* [sweet] and *kakasi* [sour] are new.

Other tastes and smells remain mainly cognates that are not lexicalised. Occasionally some smell types are referenced in comparative entities, such as *marashi* [perfume], *machingwa* [orange], *maembe* [mango], *asmini* [Jasmin] and *chiluwa* [Mkilua]. Taste is referenced as *limau* [lemon] or *munyu* [salty]. Due to the minimal lexicon, plant characters are rarely described by taste or smell.

Texture and surface feel descriptions

Laini	smooth surface
Maugu	rough surface, with conical structures
Kwaruza	rough surface

Guwika	peeling bark
Mialo	fluted or fissured
Ereza	slippery
Magophamagopha	flaking or scaly
Mabaramabara	has patches (lichen growth)

Texture descriptions are commonly used for the bark of the stem and root. Some of these descriptive terms (i.e. *laini, maugu,* and *kwaruza*) are also used the shin of root tubers and fruits. The descriptions *laini* and *kwaruza* are also applicable to leaf surfaces. The term *laini* is probably borrowed from Swahili, and there is no clear evidence on its origin.

Specific descriptive terms for plant part

Description of the leaves

In addition to the application of most of the general descriptive terms (above), leaves are described in terms of the upper and lower surfaces as *dzulu* [upper] and *nyuma* [behind] respectively. Upper surface is also known as *ndani* [inside] and lower surface as *konze* [outside]. A horizontally positioned leaf has a clear upper and lower side, fitting the descriptions *dzulu* and *nyuma* respectively. However, it is in a vertical young leaf, whose sides are described in science as 'adaxial' and 'abaxial' respectively, that the logic of the Digo labels '*ndani* and '*konze*' (respectively) is clear. This is indicative of an observational behaviour of the Digo in the development process of the leaf.

Leaf shape is described extensively by the variations in leaf types, as:

- *kodza mwenga* [simple leaf], which means 'one leaf'
- *makodza ga panda mwenga* [pinnate leaves], which means 'leaves with one branching'
- *makodza ga panda mbiri* [bi-pinnate leaves], means 'leaves with two branching'
- *makodza ga mala* [lobed leaves], means 'leaves with fingers' (cf. terms relative to leaf).

In addition to *laini* [smooth] and *ina kwaruza* [rough surface], leaf surface feel is also described as *msasa* [sand papery], *ina manyoya* [hairy], and *ina awisa* [itchy].

Flowers and fruits

The flower is the least described plant part by the Digo. Apart from abstract colour descriptions, relative size and smell connotations (cf. general descriptive terms), Digo verbal

expression on flower features is minimal. Notable lacking in Digo lexicon are descriptive terms for the varied colour patterns and the array of smells in flowers.

Fruit descriptions are mainly based on maturation stage, colour, taste and smell (cf. general descriptive terms).

Description of the roots

Roots are often overlooked, probably because of growing underground. Thus except for roots of food value, this plant part is not elaborately described. The edible roots and root-tubers are characterised by size, colour and taste features (cf. general description terms). An only root specific description is *pukupuku* [small pieces] refers to small cassava or potato tubers.

Description of the tree canopies

The crown of a tree is neither lexicalised nor described in Digo. However, some differences seemed to be cognately appreciated, thus some provisional descriptions were given, such as: *Muhi wa kuvimba* [plant with a wide crown], *muhi wa kuvimba photsi* [plant with wide crown base], *Muhi wa kumera kuganya panda* [plant with interlocking branches]. But the overall impression was that tree canopies are unknown.

3.3.5 Derived linguistic expressions for plant features

During the interviews and discussions, some plant descriptions used were linguistic expressions derived from attributes in human life situation, introduced into plant life situations, as follows.

Kuhambala – to crawl. Refers to creepers e.g. *Cissampelos paraire* and *Abrus precatorius*.
Kupanda – to climb. Refers to climbing growth form of liana and climber species.
Kugwira – to hold. This refers to the attachment of plant onto others using tendrils or twining.
Kuvyala – to give birth. This refers to fruit producing period and process.
Kuodzaza – to fill. This refers to high fruit production in the plant e.g. mango tree.
Kulala – to sleep. This refers to leaning position for a plant i.e. when not standing up right.
Kuzama – to bend. This is synonym to *kulala*.
Kuima – to stand. This refers to the upright position for the plant.
Kumyoka – to bend. This refers to a bent form of a plant part, e.g. a pole.
Kunyooka – to be straight. This refers to a straight form in a plant part, especially for poles.
Kuvwala nguo – to dress. Refers to plant closing its leaves on touch e.g. *Biophytum petersianum*.

Kubadilisha nguo – to change cloth, e.g. deciduous plants producing new leaves after dry season.
Kurya – to eat. Refers to the feeding process, where plants are said to 'eat soil' through roots
Kuhama – to taste. This refers to a good taste in a plant or plant part.
Kuriphiza – to revenge. Plants are believed to avenge for bad treatment, e.g. coconut tree, can drop a fruit on someone (or his close relative) when that person hits it without a good reason.
Kuishi – to live. This refers to the living state of the plant
Kufwa – to die. This refers to the end of the life of the plant.

3.3.6 Mushrooms

Uoga refers to mushrooms, and also known as *udzondzo*. However, these labels specifically refer to fleshy mushrooms. Non-fleshy mushrooms are addressed as *woga koma* or *udzondzo koma*, meaning 'wild or poisonous mushrooms', and the label also apply to fleshy mushrooms that are not eaten. A mushroom comprises of the following parts.

Uoga	mushroom cap
Nyama za uoga	fleshy edible parts of mushroom (cap and stem)
Muhi wa uoga	stem, foot
Mgoti	synonym for *muhi wa woga*
Miraba	the gills
Fundula	stage when the cap is still closed
Bumula	stage when the cap is open (concave, convex or flat form)

COMMENTS
The *uoga* [mushroom] is utilised as food, but specifically used is the cap, which is also referred by the name *uoga*, underscoring an earlier argument that the useful part shares the name with the whole. The term *uoga* goes back to the CB term *yoga*, but its plural '*vyoga*' also refers to a skin disease (characterised by dotted spots, just like mushroom clusters or the velum partiale on the cap). One respondent linked the relationship of the disease with mushroom by arguing that someone suffering from the disease is not allowed to eat mushrooms. This was though not confirmed by other respondents.

The fleshy part of the mushroom, also known as *nyama za uoga* [mushroom meat], include the cap and the stem. This part is labelled with 'meat' term in reference to its 'fleshy' state as well as its 'tasty' aspects. In fact, in a strict sense, the term *nyama* is attributed to a specific

mushroom, i.e. *choga-nyama* [meat mushroom] a *Termitomyces* spp., which was said to be as 'tasty' as beef.

The mushroom stem (foot) is identified as the 'stem' i.e. *muhi wa woga* [stem of mushroom], also known as *mgoti*, whose etymology is unknown. The term *miraba*, whose etymology is 'marks', for the gills of the mushroom is typically descriptive. But the label was not common among respondents, thus it was not immediately established if it is genuine or not. Notable, some mushroom parts (e.g. sheath, velum partiale and spores) are not lexicalised in Digo.

In its development the mushroom changes from *fundula* [closed cap] to *bumula* [open cap]. During mushroom collection preference is made on the *fundula* stage, as in *bumula* the mushroom is usually infested by pin-worms. Other morphological variations in the mushrooms (e.g. convex, concave or flat cap) seemed less important to the Digo, as they are not lexicalised. But notably, different edible species, their habitats and time-periods of growths are well understood by the collectors. The mushroom collectors broadly recognised mushroom habitats, i.e., *Brachystegia* woodland [*mirihini*], farmland areas [*mdani*] and termite mounds [*tsuluni*], as well as the respective species found in these habitats.

All the respondents would not try mushrooms that were not known to them as edible, even when presented with scientific literature as evidence of edibility. Thus, only about 10 mushroom taxa were considered edible to the Digo (as learnt from their elders), take no risks in trying the about 50 other species indicated as edible in the scientific literature and were available in their environs. This showed an obvious strong mistrust to scientific opinion on one hand and unquestioned trust in traditional knowledge on the other hand.

3.4 CONCLUSIONS

The above observations give clear evidence that the Digo have a considerable verbal component in their plant knowledge (lexicon and descriptive terminology). However, the lexicon is not exhaustive, as there are recognisable gaps e.g. flower parts or non-verbalised plant features (aroma and taste features), some of which are cognitively but not verbally appreciated. It can be concluded that, unlike modern botanists, the Digo are selective on the plant knowledge of interest to them. This can be appreciated on the basis that the Digo are not striving for absolute plant knowledge, which is a characteristic of folk botanical knowledge.

The lexicon of plant parts is noted to be of varied meanings and sending different messages across, and each label has a different degree of inclusiveness. While some labels are used for specific plant parts, there are lexicons that are collective terminologies for parts either on the bases of structural, functional or numerical function. Among the collective term labels, the structural bases account for most of the Digo plant lexicon. Examples of collective term labels are presented in Table 3.3 below.

Commonly noted, the Digo plant lexicon is not exclusively translatable to English or scientific equivalents, as member plant labels (e.g. *kodza, ruwa, mizi*) sometimes differ. Thus there are only approximate equivalent terms between the Digo and the scientific terms, e.g. leaves for *makodza*, flower for *ruwa*, fruit for *tunda*, and root for *muzi*, but in the strict sense, the Digo terms contrast scientific terms by including or excluding parts that make them considerable different from the equivalent scientific terms.

Table 3.1: Examples of different collective term labels in Digo plant lexicon

Structural lexicon	**Functional lexicon**	**Numerical markers**
Punga [male inflorescence of maize, florets in coconut flower, panicles in *Panicum* spp.]	*Ruwa* [colourful, beautiful, ornamental and reproductive plant or plant part]	*Pindi* [stem segments, individual root tubers]
Dzitso [scar on seed, or mark on root tuber, three 'eyes on coconut seed]	*Utsungu* [bitter, poisonous latex]	*Mala* ['finger' – leaf lobes, monocarp or fusiform fruits e.g. banana]
Pango [hole]	*Chitsa* [embryo in all seeds]	
Tembe [seeds, grains of all kinds – plants and non-plant]	*Mbeyu* [propagation plant material]	
Mlita [stalk – fruit stalk, leaf petiole]	*Gamu* [sticky latex]	
Pingu [a swelling, root nodule, magical charm]	*Nyama* [fleshy and tasty plant part e.g. mushroom meat]	
Lutsa [any sharp end, including leaf apex]		
Ngao [shield, tree buttress]		
Mwezi [embryo in coconut seed, cotyledon in mango seed]		

In the Digo plant labelling and description, there is a considerable transfer from human/animal life situation to the plant world, and vice versa. To some extent the transfers are based on the Digo having a better knowledge in the human life situations where structural and functional knowledge of parts and systems is relatively better understood compared to the situation in plant world. Thus human/animal labels such as *nyama* [meat], *mromo* [mouth], *dzitso* [eye], *mongo_* [backbone], *mishipa_* [veins], and *mala_* [fingers] are used as labels for plant parts. In the other direction, labels for plant parts are used literally or metaphorically to human life situations. The plant lexicon *gopha* [bark], *sina* [basal stem], *kolo* [basal stem] and *mbeyu* [seed], are used in human and animal life situation as: *gopha* for wound cover, *sina* for ancestry, *kolo* for ancestry or historical links, *mizi* for origin or stability, and *mbeyu* for blood lineage. In some cases there are back and forth transfers in the labelling. For example, the transfer of *gopha* into human life situation, led to the transfer of *chironda* [wound] into plant life situation. In the latter, *chironda* refers to an injury or a scar on the bark of the stem (Fig. 3.11).

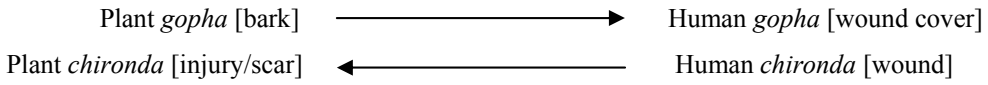


Fig. 3.11: A schematic illustration of an example of reciprocal transfers for labels between human and plant situations

Other transfers led to new use value for the part, e.g. *pingu*, which originally means magic charms, when used to label root nodules this led to the latter being used in making the charms.

The Digo plant lexicon includes both old and contemporary terms. In other words, some terms have been maintained from the old CB or PSA terminologies (whole or in part), but others are completely new, being either changed from the 'old' CB or PSA terms or are innovations used to fill gaps in the old language. Examples of maintained historical lexicon include: *panda* [branch], *tunda* [fruit], (*m)beyu* [seed], *wulimbo* [birdlime], *kuti* [coconut leaf], and *ukuti* [mid-rib of coconut leaf frond]. Modified lexicon include: *muhi* [stem] from *ti* (CB) and *muti* (PSA), *sina* [basal stem] from *kina* (CB) and *ishina* (PSA), *kolo* [basal stem] from *kodo* (CB) and *ikolo* (PSA), and *ruwa* [flower] from *duba* (CB) and *iluwa* (PSA). Changed or new lexicon includes *kodza* [leaf], which was originally *jani* (CB); and *muzi* [root], which was originally *di* (CB). This is evidence that some 'old' (non-plant) lexicon have in the 'new' Digo received wider application that includes plant labelling. For example: *Mucele* (PSA) referred to clean grain then, but today is used as *mtele* [cleaned rice grain] and *tsere* [maize grain]. *Mpunga* referred to rice plant, and is today used as *mphunga* [rice plant], and *punga*

[male inflorescence of maize plant, florets of coconut tree, panicles of grasses]. In addition, terms such as *yada/ kyala* [finger], *cungu* [bitter], *kipa/mushipa* [vein], *ji/maji* [water], *gongo/mugongo* [backbone], *igaWo* [shield], *pingu* [charm] and *diba* [milk] which existed from early times, their application in plant lexicon is relatively a new phenomenon. The above elaborations reflect the Digo plant knowledge as an active knowledge that adjust to challenges such as new observations and new plant entries or discoveries, without necessarily being influenced by outside world. Even during the field work of this study it was noted that 'innovation' in plant lexicon and 'new' observation in plant variations or details, is going on among the Digo. For example, few respondents referred to flower petals and sepals as *viapha* [small wings], and flower stamens and filaments as *vishale* [small arrows] obviously putting structural implications to perspective, and 'create' a label where otherwise there is none. If these are maintained and spread to the wider Digo population, the labels will in future form part of common Digo plant knowledge and become genuinely accepted terms in plant lexicon. In addition to innovations, there are also loan words in Digo plant lexicon. The Swahili have contributed considerably to the Digo vocabulary, particularly for the newly introduced crop plants such as coconut, banana, cotton, and kopak. In addition to trade and social contact, the Swahili, through Islam, also influence plant related knowledge and culture of the Digo, for example the label *mashada* [decorative leaves in a wedding ceremony] and related practices are suspected to be of Swahili-Islam origin. During this study, a potential loan in plant labelling was noted, i.e. *thamra* (a synonym for *punga*), suspected to be either of Swahili or Tanzanian language origin. Although it was not yet common, if in future more Digo come to contact with it, it could form a common synonym to *punga* in future.

The referent in Digo plant lexicon can vary on the bases of socio-cultural events. Thus, *ruwa*, which commonly refers to flower, extends to the context of 'colourful', 'love', 'beauty' and 'ornamentation'. In ornamentation *ruwa* refers to flowerless and non-flowering plants. On the same note, the leaf which is commonly known as *kodza*, remains the referent but the label changes with socio-cultural context, hence referred as: *maruwa* in funeral rites*, mashada* in wedding ceremony*, dawa* in phytotherapy, and *mtsunga* as vegetable.

Although not indicated in the semantics of the lexicon, the incentive for both plant part labelling and description, to a greater extent but not exclusively, is value oriented. Thus plants and plant parts which are of common use are labelled in detail, a fact that separates crop plants e.g. the coconut palm, from wild species. This leads to the use of a coconut palm as a prototype for related wild palm species, in both lexicon and description. This is evidence that

the frequent contact and interest instilled by need made the Digo eloquent and detailed in plant knowledge biased to ‘useful’ parts and species. Thus, although the Digo lexicon in general is less comprehensive, in some areas the Digo labelling or description is more detailed compared to the scientific terminology. This is notable in the specific lexicon for coconut e.g. the distinction and labelling of coconut fruit stages. Therefore characterizing the Digo plant knowledge as comparatively poor or rich strongly depends on the plants in question.

Comparatively, among the parts, leaves are the most described parts, while the flowers are the least. Although leaves are not the most utilised parts (Pakia & Cooke 2003a) they have the most diversified uses (ranging from food, building, crafting, medicine, decoration, funeral rites etc) compared to other plant parts. This is in addition to being of varied types and being more common in many plants. These features combine to contribute to the high lexical inputs and description of leaves. Flowers, on the other hand are the least used, in addition to being seasonal and commonly produced on elevated levels (in trees), which make them difficult to observe. The most striking variations in flowers are colour and scent, and both are minimally lexicalised features in Digo vocabulary, putting flowers to a disadvantage in the description.

CHAPTER FOUR
DIGO TRADITIONAL PLANT IDENTIFICATION METHODS AND COLLECTION NORMS

4.1 INTRODUCTION

After establishing the Digo plant lexicon and descriptions of plant parts in the previous chapter, in this chapter the Digo plant identification[2] methods and plant collection norms are presented. The identification methods were investigated during forest walks in company of respondents who made the identifications from whole species in the forest and sometimes from only specific parts of the species. The plant identification sessions and observations of respondents as they go through the identification process were complemented by responses from interviews (cf. question 10 in the questionnaire) and from general discussions on important plant parts and features for plant identification. The observations of, responses and explanations from respondents in all above sessions constitute of what is discussed here and presented as the 'traditional Digo plant identification methods'. The plant lexicon and descriptive terms referenced in this Chapter have been elaborately discussed in Chapter Three. Collection norms were recorded from respondents in independent discussion sessions. The Chapter is presented along the following topical issues:

- Plant features used for identification
- Human senses used in plant identification
- Diversified professional basis of plant identification
- Traditional trainings in plant identifications
- Significance of environment in plant identification
- Norms in plant material collection
- Conclusion

4.2 PLANT FEATURES USED FOR IDENTIFICATION

From the observations of and explanations from the respondents, notes were made on the identification of 261 scientific species, which were identified as 236 plant taxa in Digo perspective (Appendix V), a ratio of 1:1.1 (Digo : science), which is almost a one-to-one ration. The list excludes cultivated crop plants although these are mentioned in the text. It is clear that most of the plant taxa recognised by the Digo are each equivalent to a scientific plant taxon,

[2] 'Identification' here refers to the process of plant recognition, which includes the verbalised expressions and the non-verbalised actions of the respondent in the field as they go through the identification process.

except for few cases where two or more scientific species are coalesced e.g. *Chiahira* for epiphytes and *Mbodzembodze* for species with desiccating leaves. The Digo also recognise as two different taxa the sub-species *Lannea schweinfurthii* ssp. *stuhlmannii* and *Lannea schweinfurthii* ssp. *acuminata*, i.e. *Mchumbu* and *Mchumbu madzi* respectively. This is one of rare cases where sub-species are identified as different in Digo.

Based on the notes, the Digo identify plants mainly via morphological features of parts (leaves, bark, root, and fruits) and to a lesser extent via aroma, taste and sound features of the parts. In herbaceous species e.g. grasses and epiphytes, the whole plant was important for identification. The following are discussions plant features used for identification in each individual plant part.

4.2.1 Plant identification from leaf features

The leaf features used for plant identification include the shape, size, texture (surface feel), colour, smell and taste. The leaf shape was the preferred feature for plant identification compared to the other features. This is because leaf shapes are more diversified and are verbally distinguished (cf. Chapter 3). In contrast, leaf size has only rudimentary comparative references; distinct leaf texture features such as sand papery, are found in a limited number of species; and colour, smell and taste have minimal lexical distinctions (cf. Chapter 3).

Leaf shape features are diversified by the varied leaf types, e.g. *kodza mwenga* [one leaf] for simple leaf, *makodza ga panda mwenga* [leaves with single branching] for pinnate leaves, *makodza ga panda mbiri* [leaves with two branching] for bi-pinnate leaves, and *makodza ga mala* [leaves with fingers] for lobbed leaves. These variations form the starting point of identification and recognition of species. Distinctions in leaf sizes i.e. *kulu* [large], *dide* [small], *pana* [broad], *dzembamba* [thin], and *zito* [thick or succulent], is not systematic, thus they are only useful for contrasting specific leaves within and between species, but not for strict species identification. This is also true even in scientific botany, where the ranges of leaf size specifications are arbitrary, and not strongly indicative of species, except in comparative context (Beentje 1994).

Leaf texture (surface feel) mainly concerns the leaf blade, and are lexicalised as: *laini* [plain], *ina manyoya* [hairy], *msasa* [sandpapery], i*na kwaruza* [rough surface] and *ina awisa* [itchy] (cf. Chapter 3). However, only sandpapery and itchy features are useful in plant identification due to their specific association with the relevant species, while the other features are less unique

among species and unreliable for plant identification. But even with the sandpapery and itchy features, the use of these features in identification is minimal because of the limited number of species that have these. Sandpapery leaves are known to occur in *Ficus exasperata* and *Cordia monoica*, both named after sand paper, i.e., *Msasa*. Itchy feeling is known to result on contact with leaves of *Mwamdzavi* [*Tragea furialis*].

Traditionally, plant description and differentiation on the bases of colour is restricted to the basic colour terms (*nyiru, nyereru* and *kundu*), which makes the distinction between species rather minimal. The notable case where leaf colour was important in plant identification was for species with leaves of different colour shades on the upper and the lower sides, e.g. *Mtsunduzi* [*Croton megalocarpoides*] and *Mweza* [*Achyranthus emerginatus*]. These species are identifiable from the leaf colour patterns, described as '*ndani n'maru, konze n'mereru*' ['green' upper surface, and whitish lower surface]. Similar descriptions are used in modern botany, for example Beentje (1994) describes *C. megalocarpoides* as 'leaves are silvery beneath …'.

In contrast to the above features, smell has minimal lexicons (cf. Chapter 3), which are also too general. Although more smell types are recognised these are not lexicalised nor described, thus are difficult to use. However, in this study, healers were noted to indulged in continued contact and usage of smell and consequently develop some experience such that they can operate without verbal expressions. Thus healers through 'experience' are able to distinguish species from different smell kinds, and endure the absence of lexicons.

Taste, like smell, is categorised rather in few domains (cf. Chapter 3). The taste domains used in plant identification of wild species are *utsungu* [bitter] (e.g. for *Azadirachta indica* and *Launaea cornuta*), and *kakasi* [sour] (e.g. for *Cyphostemma adenocaule*). However, all the three tastes (*mtswano* [sweet], *utsungu* [bitter] and *kakasi* [sour]) are used for edible plants, both domesticated and wild species. But the overall observation still remains, that the lexicon of taste is not exhaustive, and other taste varieties remain non-verbalised. Due to its limited lexical, taste outside the edible species is not used, and individual are particularly hesitant to take the risks involved with poisoning from unfamiliar species.

The low reliance of colour, and the unpopularity of smell and taste features in plant identification apply for all plant parts. Even the healers who ventures into using smell features in plant identification, they do so only for some species e.g. *Mdungu* [*Zanthoxylum chalybeum*], *Mgweni*

mdide [*Uvaria acuminata*], *Mwangajine* [*Uvariodendron kirkii*], *Mvuma* [*Premna chrysoclada*], *Muurusapungu* [*Premna hildebrandtii*] and *Chivumbani* [*Ocimum suave*].

The substantial use of leaf features in plant identification by the Digo concurs significantly with the modern botanical methods, as referenced in the Flora of Tropical East Africa (FTEA) and in Beentje (1994). However, there are also some contrasts between the two authorities. A traditional Digo identifies most plants via features in fresh leaf, while a modern taxonomist identifies even dried sample specimens. Some respondents explained this knowledge limitation as due to the damaging effect caused by drying, as important identification features (to the Digo) are tampered. Practical observations though, showed that except for colour and partly shape, some leaf features are not significantly affected. Assumable, therefore, it is the lack of need to identify dried specimen that made the Digo inexperienced with dried specimens. On the contrary, modern taxonomist is continuously challenged to identify dry specimens. This assumption is supported by the ability of Digo healer to identify dried specimens (at least for some species), because of the need posed by his work.

4.2.2 Plant identification from stem features

The Digo differentiate stems via bark colour, texture (surface feel), presence of growths (e.g. lichen) and exudates (cf. Chapter 3). Although some plant species are differentiated and identified via stem colour e.g. *Mlala mwereru* [black *mlala*] for *Monodora grandidieri*, and *Mlala mwiru* [white *mlala*] for *Disopyros kabuyeana*, commonly the differentiation is between related plants - from a Digo perspective. The example above shows differentiated species of the 'genus' *Mlala*. Differentiation is also done for *Mkongolo* species i.e. *Mkongolo mwiru* [black *Mkongolo*] and *Mkongolo wa kundu* [red *Mkongolo*]. Otherwise, stem colour, is not a feature useful in general plant identification.

Variations in stem surface are recognised among the Digo (cf. Chapter 3) but only a few are unique enough or restricted to specific species to be used in plant identification. These include *ereza* [slippery] in *Bombax rhodognaphalon*; *mialo* [fluted] in *Synsepalum* spp; *maugu* [conical structures] in *Zanthoxylum chalybeum* and *guwika* [peeling] in *Commiphora* spp. The other stem surface features are either too common or less salient, and not used in the identification.

Although seven kinds of exudates are known and labelled (cf. Chapter 3), the Digo make minimal reliance on exudates for plant identification, limited to species with commonly useful

such as the historical commercialised gum copal [*gamu*] from *Hymnaea verrucosa* (Spear 1978). Continued contact and interest seem important here to develop the necessary experience.

4.2.3 Plant identification from fruit features

Generally, only the plants whose fruits are edible (Pakia 1997) were identifiable from fruits. Also species whose fruits have other social values e.g. medicinal (*Catunaregam nilotica* and *Solanum incanum*) or as tools for playing games (*Caesalpinia bonduc*) (Pakia & Cooke 2003a, b) were identifiable from their fruits. Some herbaceous species have injurious fruits which make them identifiable from their fruits, e.g. *Oxygonum sinuatum*, *Bidens pilosa* and *Cenchris mitis*. And so is the twining *Mucuna puriens* [*Uphupu*] whose fruits lead to an itchy feeling on contact. Otherwise for most wild species identification via fruits is unreliable, and is commonly complemented by features in other plant parts. The identification of plants via fruits for crop plants is very detailed, usually accomplished to cultivar level. Using fruit features, a Digo farmer differentiates assorted mango cultivars (*boribo, ngoe, dodo, shikio, chidigo, chimaji,* and *epoli*). This also applies for coconut cultivars (*mnazi mwiru* [black coconut tree]*, mnazi wa kundu* [red coconut tree]*,* and *mnazi wa chisamli* [yellow coconut tree]); and papaya cultivars (*moyo wa simba* [lion's heart] and *moyo mwereru* [white heart]). In maize corns, the colour patterns of seeds are used to differentiate between cultivars such as: *maricheni* [yellow kernels], *chitweka* [black kernels]*, tsere ra matungo* [black, red, and white kernels]*,* and *tsere ra mjundo* [striped kernels]. In contrast, even wild species that are identifiable via fruits, sometimes the identification does not go to species level. For example, *Uvaria lucida* and *Uvaria acuminata* are distinguishable via leaves to basic taxa *Mngweni-mkulu* and *Mngweni-mdide* respectively. However, via fruits the identification is done only to the genus level '*Mngweni*', then respondents fail to make further distinctions.

4.2.4 Plant identification from flower features

Flowers are less used in plant identification by the Digo. Respondents presented with flowers, particularly of wild species, consulted other plant parts for identification or comment. This behaviour was encountered even for common tree species such as *Milicia excelsa*, *Diospyros squarrosa* and *Afzelia quanzensis*. The few exceptions where plant identification via flower features were done include species whose flowers have local values, e.g. ornamentation plants (*Bouganvillea* sp., *Thevetia peruviana*, *Stachytarpheta jamaicensis* and *Lantana camara*); perfume plants (*Mkilua fragrans* and *Cananga odorata*)*;* broom making species (*Panicum*

maximum) and flowers are used in spiritual healing (*Nymphaea* sp. and *Nymphoides forbesiana*). Few species have salient flower distinction and were identified via their flowers, e.g. *Gloriosa superba*. The minimal reliance of flower in plant identification by the Digo is a significant deviation from modern science, which strongly relies on flower details (Beentje 1994). Low reliance on flower for plant identification by the Digo is possible due to flowers being least used (hence relatively less physical and conceptual contacts made with it), flowers are only seasonal, and the flower features are minimally lexicalised.

4.2.5 Plant identification from root features

Generally, plant identification from root features is the least common for wild species, except for plants with edible roots e.g. *Mariga* [*Dioscorea dumetorum*] and 'perfume-root' plant *Mrandze* [*Dalbergia boehmii*]. However, the use values of these species are no practices, and their identification knowledge was recorded among only the elderly Digo. Crop plants with roots of food value e.g. cassava, are identified considerably via their roots, mainly through colour and taste. Thus in the local market, cassava tubers are identifiable to a majority of the Digo through colour to cultivar levels e.g. *chibandameno, chileso, guzo, mjiriama*. The tastes of different cassava cultivars (and other edible roots) are not elaborately lexicalised, except for the broad categories of *autsungu* [bitter] or *ka-utsungu* [non-bitter]. Some wild species with roots of medicinal value are also identifiable from their roots, using features such as colour, smell and taste e.g. *Zanthoxylum chalybeum, Premna chrysoclada, Uvariodendron kirkii*. However, this is specifically used by Digo healers.

4.2.6 Plant identification at different plant development stages

For most seedlings, respondents gave wrong identifications or confessed that they did not know the plant. This was the case despite a correct identification of the mature plant specimen of those species, and was observed for even common tree species such as *Combretum schumannii* (*mkongolo*), *Julbernardia magnistipulata* (*mkuwa*), *Milicia excelsa* (*mvure*) and *Cynometra suaheliensis* (*mfunda*). The situation was even more difficult for species associated with morphological changes in the developmental stages e.g. *Schlechterina mitostemmatoides* [*Mfunganyama*]. The seedling and sapling stages of *S. mitostemmatoides* have small deeply indented leaves, while the mature stage has relatively large leaves with serrated margins (Beentje 1994). The respondents failed to link the seedling and sapling stages to the mature stage of this species. A similar observation was made by Palgrave (1977) studying the local notion of baobab

tree in southern Africa, where young plant of baobab was not perceived by the native community. In addition to the common variation between young and mature stages of plants, another possible reason for the young individuals not to be identified would be that, in contrast to the mature stage, they are not used by the Digo.

4.2.7 Plant identification by habit of the species

In addition to morphological features, some plants are identifiable through peculiar habits. For example: *Biophytum petersianum* and *Mimosa pudica* are identified by the desiccation habit i.e. closing leaves on touch; and *Synaptolepis kirkii* and *Garcinia livingstonei* are identified by their 'fixed' branching patterns (twice and thrice respectively).

In summary, considering the frequency of use for all the plant parts in the corpus of 236 taxa (Appendix V), the leaf was the most used in plant identification, while the flower was the least (Table 3.1). In fact, for most species the other parts only complimented the leaf in plant identification. Only about 10% of the species in the corpus (Appendix V) were unidentifiable from leaves alone, because their leaves were either not prominent enough in these species or too similar between species to reveal the differences. These include: *Tacca leontopetaloides, Cissus* spp., *Euphorbia* spp. *Asparagus* spp., Sedges and grasses. To the Digo, the leaves in grasses and sedges are generally similar, hence undifferentiated. In the Table below identification via the roots was excluded because its data was an underestimate following refusal by healers to divulge complete information on medicinal species identifiable by roots. However, it is still estimated that the flower remains the least used plant part in identification. Notable, in tree species flower is not used at all in identification.

Table 4.1: Frequency of application of plant parts in traditional Digo plant identification methods for some species (n=236) of different growth forms. It should be noted that some identification cases overlap.

Growth form	**Total number**	**Leaves**	**Stem**	**Fruits**	**Flower**	**Whole plant**
Tree	92	90	28	18	0	3
Shrub	73	68	8	13	5	5
Climber	12	9	5	4	0	1
Epiphyte- Parasite	2	0	0	0	0	2
Herbs	47	35	2	6	3	10
Grasses	10	4	1	1	1	4
Total cases	236	206	44	42	9	25

4.3. HUMAN SENSES USED IN PLANT DENTIFICATION

As most species were identified from morphological features that are visually recognisable, the visual sense accounted for most of the identification. Surprisingly, though, colour in flowers has a high visual perception, but it is not used in plant identification.

Through the sense of touch, relatively few physical aspects of plant parts such as hairy condition, rough or smooth condition, sandpapery and desiccation are recognised. In the identification process, sometimes respondents walked to a plant and touched it (particularly the leaves) before giving an identity of the species, with confidence. However, touch was commonly used to confirm species with sand papery leaves (*Ficus exasperata* and *Cordia monoica*) or desiccate leaves (*Biophytum* spp and *Mimosa pudica*). Identification by 'itchy' feeling (as in *Tragea furialis* and *Mucuna puriens*) are usually only coincidental but not intended method of identification.

As noted earlier, smell and taste are not commonly applied in plant identification, except for perfume and food plants. Healers use these features to identify a limited number of medicinal value. However, even the Digo healers do not use the scent in flower for identification, most likely because of the limited use of the flower for medicinal purposes.

Although 'hearing' is not enlisted as a method in plant identification in scientific botany, a Digo can identify *Acacia zanzibarica* from 'the noise' caused by wind effect. This is the only species identified via hearing by the Digo

In summary, the Digo use all senses for plant identification, but on the basis of the frequency each sense was used, visual accounts for most identifications (Table 3.2). For most species the other senses were used only to confirm the identification. Out of the corpus of 236 taxa (Appendix V), the frequency for each sense show that visual accounts for 100**%,** and is confirmed by touch (3**%)**; smell (6**%)**; taste (4%); and hearing (less than 1%). The relatively high account for 'taste' is a result of wild edible fruit species.

Table 4.2: Frequency of application of human senses in traditional Digo plant identification methods for some plant species (n=236) of different growth forms.

Growth form	Number (n)	Visual	Confirmation through			
			Touch	Smell	Taste	Hearing
Tree	92	92	1	4	5	1
Shrub	73	73	3	9	1	0
Climber	12	12	0	0	0	0
Epiphytes - Parasites	2	2	0	0	0	0
Herbs	47	47	3	1	3	0
Grasses	10	10	o	0	0	0
Total cases	236	236	7	14	9	1

4.4 DIVERSIFIED PROFESSIONAL BASIS OF PLANT IDENTIFICATION

The Digo plant identification methods are manifold, with identification approaches generally being different from person to person, and varied from species to species. To an extent the identification methods suggest specialisation due to varied plant usage. Individuals from different plant user groups, which also create local professional categories, focus on different plant parts in the identification process. Each user group put emphasis on the 'useful' part as defined by the group, and make that part the central focus of plant identification. The variations between plant user groups are discussed below.

4.4.1 Plant identification by timber users

Timber users (pole-cutters, house builders and carpenters), use morphological features of leaves, bark of stem, and features of inner wood, to identify plants, but without knowing any differences in the roots of the species in question. In addition to the commonly used plant features, timber users use specialists' knowledge of inner wood variations to identify 'useful' species. These include colour and smell. Although smell is used, it is generally unlabelled and only broadly described as *taina harufu* [no smell], *inharufu chache* [weak smell] or *inharufu sana* [strong smell]. Timber plunks of *Albizia versicolor* and *Milicia excelsa* are identified with a 'strong' smell, but their variation, which are cognately perceived, are not verbalised. Some carpenters are allergic to smell in specific species hence avoid them. Colour patterns in wood grain [*nyama za muhi*] are also used, but mostly remain non-lexicalised too. The identification here seems to be

based on long term contact and experience. The ability to identify both standing trees in the forest, timber plunks and processed timber products (furniture pieces) using the inner wood features, timber users supersede other plant users in this respect. However, the plant identification knowledge of timber users hardly goes beyond the important timber species. Carpenters, for example, have a very good knowledge of both local sawn timber species (e.g. *Mvure, Mtsani*, *Mzambarau*, *Mrihi* and *Mbambakofi*) as well as non-coastal timber species Cypress and Pine (identified in their English names). This is despite the carpenters not having seen the standing trees of the non-coastal species. Surprisingly, these carpenters failed to make correct identifications for some common Kenya coastal forest tree species that grew in the local forests, e.g. *Mfunda, Mkuwa*, *Mchizatsaka*, *Chikunguni* and *Mtsamvia*. The tree species that carpenters fail to identify were mainly those that are 'not important' for sawn timber.

In addition to the useful species, timber users also have a good knowledge on prohibited or disguise species in their trade. Pole collectors recognise species prohibited from building e.g. *Mfumula ndolwa* and *Mviru*, which are believed to lead to domestic problems when used as building poles. Carpenters identify *Mnguonguo* (coined as 'false *Mvule*') which resembles *Mvure*, but has poor wood quality that is not durable for carpentry.

4.4.2 Plant identification by non-timber users

Plant identification by vegetable gatherers

On the other hand, vegetable gatherers (mainly Digo housewives) identify plant species via leaf features, and their knowledge is biased to edible herbaceous plants. While the vegetable species are identified and labelled with specific names, non-edible herbaceous species are collectively referred to as *nyasi* [grasses], with the connotations of 'useless'. The plant identification knowledge of house wives hardly extended to tree species, and generally failed to distinguish between very important local timber species e.g. *Mvure, Mtsani, Mbambakofi* etc. They could neither distinguish the standing trees nor sawn timber plunks or finished furniture pieces of these species. Surprisingly, most of them identified standing trees of *Brachystegia spiciformis*, because this tree species is associated with some edible mushroom types that they also collect. But even for *Brachystegia spiciformis* they could not identify it from its inner wood features.

Plant identification by mushroom collectors

The Digo house wives are also the collectors of mushrooms (fruiting bodies of fungi), which are identified mainly on the basis of colour of cap. On a broad perspective, mushrooms are also recognised on the basis of their habitat, thus specific mushroom types are expected at different habitat areas (cf. Chapter 3). Some of the identification features are reflected as descriptive affixes in the mushrooms names. For example: *Nimakoba-mwereru* [white *Nimakoba*] for *Russula aeruginea; Nimakoba-wakundu* [red *Nimakoba*] for *Russula aquosa*; *Nkuvi-mdide* [small *Nkuvi*] for *Termitomyces* sp.*; Nkuvi-wa-mdani* [farmland *Nkuvi*] for another *Termitomyces* sp., and *Nkuvi-wa-mirihini* [*Brachystegia* woodland *Nkuvi*] for a different *Termitomyces* sp. Depicting their vegetable knowledge patterns in mushroom, the gatherers differentiate and identify only edible mushrooms. Non-edible mushrooms, which have no other known use except the suspicion that they are poisonous, are collectively known as *uoga koma* [wild/poisonous mushroom]. There is a strong rigidity in mushroom consumption, as only those learnt from the elders as 'edible', are collected and eaten (about 10 taxa only) (cf. Chapter 3).

Plant identification by healers

In contrast to the other plant user groups, a Digo healer identifies plants through a multitude of features of different parts, which include the minimally lexicalised colour, smell, and taste. This is in addition to the healers being the only social group that can make plant identifications via roots (for non-food value root plants) and can identify both fresh and dry specimens. Like the other plant users, though, healers are biased to important species and parts i.e. medicinally used. Due to scarcity, medicinal plants are commonly collected in masses and are stored in a container. The medicinal plant part of a specific species in the mass is sorted when a patient visits the healer, which could be days or months after the collection. The healer sorts through the mass of dry plant parts which by then show little differences from 'untrained' eye. Surprisingly, healers sort and identify the target plant part with very little effort, a reflection of an extensive experience and a proof of a great understanding of their trade. During the field work of this study it was amazing to observe Mzee Krauni, a healer from Kombani, singles out a root piece of a specific species from a mass of root, bark, and stem pieces. The same observation was made with Abdallah Mnyenze. No wonder the Digo healing career reaches climax with age.

4.5 GENERAL PLANT IDENTIFICATION AMONG COMMON DIGO

The above 'procedural' identification methods reflect a rigorous processes, that applies to professional situations where species identification is done with great care and re-confirmation. However, a common Digo combines bits of the above based on exposure and interest, e.g. housewives who are not healers, would commonly have some knowledge on basic medicinal plants to attend basic health issues for their children. In such circumstances, the housewives would use more or less similar identification methods as used by healers. The same is true for persons interested in furniture, who learn basic features of timber species. In other words, a little of any of the professional skills would also be found among the common Digo, but the scope varies between individuals depending on need and interest.

The identification methods have are less rigorous over time as the individual become familiar with the species. Thus in an identification process, the systematic procedures described above might not be observable. The individuals seem to distinguish the plants based on familiarity and consultation of parts for fine details are done for less commonly used or collected species, or species whose identity (for some reason) is doubted and needs proper confirmation. The individuals behave in a manner indicating that they have memorized 'pictorial images' of the species in their memory where fixed characters of the species are maintained and used for the identification. This is notable by the absence of active thinking or strenuous procedures as the respondent identifies species. One glances at a species and immediately identifies it – no identification procedure is applied. The memorized 'imagines' for the plants are individually based, and non-verbalised. Thus by viewing wood grain pattern on a timber plank, a carpenter readily tells the species, but he will strain to explain the 'visual' aspects that led to the identification. This was also a common observation with members in the other plant user groups.

4.6 TRADITIONAL TRAININGS IN PLANT IDENTIFICATION

Digo plant gatherers and users receive informal training towards plant identification and application. In all situations, the trainer (usually an elderly person) accompanies the trainee (relatively younger) in collection errands, where plant identification and collection skills are demonstrated. The trainer goes through the collection process practically, demonstrating it to the trainee, whom through observation and repeating the activities learns the skills.

Considering the training of a Digo healer, on which an emphasis was put during this study, it was noted that the healer training course consists of three phases. The first phase involves forest visits where plant identifications and collections are demonstrated. The identifications constitute activities such as viewing, touching, smelling and tasting of parts of the different species, which the trainer also gives the species name and medicinal uses. The preliminary collections include the medicinally used part (bark, roots, leaves etc) and a branch (specimen) of the species. The second phase, done on the same day after the collections but at home, involves the trainee sorting the collected plant parts (after being mixed) and matching them with respective specimens of the species. While sorting, the trainee also gives the name of the species and its medicinal uses, as taught by the trainer. The first and second phases are repeated for undefined period of time, with new species introduced in the collection and sorting as the trainee masters the previous species, to the satisfaction of the trainer. In an advanced stage, the third phase, the trainee sorts the parts as above, but now only handling the relevant medicinal plant parts which are usually in dry state. The trainee continuously repeats the identification of species from the plant parts, at the same time giving the names and the medicinal uses of the species. In essence, the trainee learns how to identify the species via the medicinally useful plant part.

The sorting and identification, is done under the instruction, supervision and guide of the healer trainer, and it comprise both verbal and non-verbal knowledge aspects. When a trainee makes mistakes in the naming, this can be verbally corrected. But when he makes mistakes in the identification, he is ordered to repeat the process, and the repeating order continues until the mistakes are rectified. Seeking verbal expressions, Mzee Krauni was once requested to explain the variations in the 'smell' of different species. In response, he shoved the plant parts to the nose of the interviewer and said '*nusa*' (smell it), indicative of the absence of verbal explanations, being a trade of experiences. The same is done with the trainees, practically learning how to differentiate different features (smells and tastes) without lexical expressions. Thus by the time the trainee graduates from his master, he is capable of identifying medicinal plants both from standing specimens and via the medicinally used parts, including dry specimens, and using features that are not verbalised e.g. smell and colour.

The healer training procedures in plant identification which focus on the useful plant part, represents a general phenomenon of the training procedures among all the other plant user groups of the Digo, only varying in the part emphasised and the intensity of the training.

4.7 THE SIGNIFICANCE OF ENVIRONMENT IN PLANT IDENTIFICATION

Conducted through different forest and wild areas (familiar and non-familiar), the respondents expressed varied readiness in plant identification and in the confidence of their responses. Plant identifications were much faster in familiar areas where collections had been made previously. The respondents expressed their familiarity in such areas and proved to be in control, knowing 'what is what' with easy and readily. However, the identification speed was significantly slower in unfamiliar areas where respondents had not visited before. Slowed identification was observed even with species commonly known to them, and some identifications were given only as tentative, as the confidence had reduced. Although a plant species could exhibit variation from one locality to another, the observations made with the respondent was beyond species variability. The difference in identification speed between 'common' and 'new' environments was based on 'familiarity' notion that builds 'experience' through continued contact with the plants in common environments. This supports the assumption that the Digo plant identification methods are not strongly based on systematic procedures (indicated earlier), but rather on memory and experience. In new environment, where abstraction is called, the respondent is not comfortable. The Digo make plant identification, therefore, is to some extent a cognitive premise that strongly relies on 'memory', and in new areas a re-orientation is necessary for identification to be done confidently.

4.8 NORMS IN PLANT COLLECTIONS

In most situations, local plant identifications are in the context of plant collection for various uses. In other words, the Digo make plant identifications with the objective of collecting the species. There are different and varied collection manner, some are relatively simple and formal, without any rituals or other customary practices involved. These include collections of timber, building poles, food, and general plant medicines. While other plant collections are relatively complex and with strong attachments to spiritual being, usually calling for observance of rituals and sacrifices. Such collections are based on the belief that plants are residences of spirits or plants are active beings and they react to human activities. Depending on collectors, the rituals observed vary. The following are examples of norms practiced by the Digo in plant collection.

Healers are characterised by both normative and non-normative norms. Among the practitioners employing less normative norms is Salim Nasoro Mwakweli, a healer from Kinondo. He feeds the spirits that reside on medicinal plants, which are believed to be responsible of the medicinal

efficacy of the plant. The spirits are fed with cereals (preferable uncooked rice, green peas or millet) by gentle throwing the grains onto the plant, while saying some words (not be divulged). The feeding is done just before the collection of the medicinal part. Failure to feed the spirits lead to calamities of different magnitudes, the least is the patient not being cured of the ailment, and the most is the healer suffering spiritual ailments or even might die.

Other healers, e.g. Ms. Nkoti Juma Ngefa, maintain silence when collecting plant medicines for treating ailments inflicted by bad spirits or by ancestral powers (*chifudu*). When collecting only hand signals are allowed in interacting with the public. Other healers, e.g. Ms. Mebakari Chakwe, walk backwards to approach a medicinal plant meant for treating pregnancy complications and to neutralise forces of evil eye. These healers give the medicine to the patients from behind (*chinyumenyume*), to 'reverse' the forces that inflicted the ailment.
According to healers, the efficacies of some plant medicines were not based on the chemical constituents, as science postulates. This is notable with the medicine for dizziness, which Mzee Abdalla Krauni cures using medicine concoction made from leaves that must be caught in the air in a swirling wind. The leaves could be of any species, and their curative power is obtained by the 'swirling' forces. On his part, Mzee Suleiman Dzilala uses a stump of any plant species found on a walkway for a charm that stops players of an opponent team from scoring in a match.

It is not the healers alone who have norms for plant collections. Large trees of all species are believed to be common residence places for spirits, and the spirits are offended when the plant is cut. Thus timber cutters, sometimes, must make sacrifices of animals (preferable black sheep) to appease the spirits. Accidents that occur during timber harvesting have been related to angry resident spirits on the tree.

For a farmer it is not allowed to carry farm harvests using ones cloth [*bindo*]. This leads to the removal of good produce from the farm. To discourage excessive harvesting, some species are labelled as 'inviters of poverty', e.g. lemons fruits, thus one always collects only enough for the day. For mushroom collectors, a giant size mushroom [*dzoga ndzovu*] is collected only after one cries before it, else collecting and eating such mushroom leads to loss of one's parents. Those who have lost their parents they don't have to cry. Children have their norms in plant collection too. It is forbidden for one to run to a mango tree for fruit collection. Running is believed to make the ripe fruits that had fallen and ready for collection to fly back onto the tree.

With the *kaya* forest system partially in practice, it is forbidden to collect any kind of plant material from the sacred sites. These include the grave yards where prominent persons were buried, praying grounds and places where community protection charm was buried. Generally it was felt being unkind to harvest and eat fruits of a plant growing on any graveyard.

4.9 CONCLUSION

The Digo plant users familiarise with the botanical world which is important to them, thus overtime they recognise and identify different plant taxa, but put significant emphasis on utility (material or immaterial). The Digo plant identification knowledge can be better understood by focusing on the learning process, which is comparative to children learning how to identify objects (Goddard 1998). It will be appreciated that some 'referents' are learnt from 'pointing out' in context, and not necessarily with the aid of words or verbal definitions (Russel 1948). Most plants to the Digo are an example of such 'referents. The fact that a healer trainee is given a plant name with no verbal descriptions for it means the trainee must develop a construct for the plant so as to relate the form and the name. Sub-consciously the trainee develops a reference 'image' (referred here as memorized 'pictorial image') useful for future identifications. In the training process, there is a clear progression from recognition of a plant based on observable physical characters (a rigorous method) to a casual 'glance' method based on the memorized 'pictorial images', and focussing on the features of the useful plant part if confirmation is needed. In other words the identification is based on familiarity that comes with experience (in which cognate images form), but the rigorous method of identification by scrutinizing features of the 'useful part' is used to confirm the identification.

The fact that the useful part in a species is different between plant user groups, there are multitude approaches in identification through the systematic method. Between Digo plant user groups, the timber users show supremacy knowledge of the inner wood features (colour, smell and patterns of the wood grains), but only limited to timber species. Healers are advanced in the application of diverse features, verbal or non-verbal, across most medicinal plant parts including roots, which are least used by other plant users. Healers are also the only social group that can comfortably identify both fresh and dry specimens. Vegetable and mushroom gatherers are concerned with only the 'edible' taxa, or plants that are indicative of their interest e.g. *Brachystegia spiciformis*, which is a tree but also an indicator of specific types of mushrooms. Otherwise, tree species do not receive much recognition from vegetable and mushroom collectors.

Partly, the plant part used for identification depends on the scope of variation of that part, as well as the extent of lexicon associated to its features. Leaves are relatively diverse and characterised with extensive lexicon and descriptions among the plant organs, consequently they are also the most used in plant identification. The considerable reliance on leaves for plant identification the Digo concur with modern science, but their disregard of flowers is a critical deviation from science. There are other notable deviations between the Digo and modern science in plant identification. While science uses theoretical principles and guided systems, the Digo use memorized 'images' of plants, and when in doubt confirm by focussing on the useful part of the species. Since the Digo plant identification is associated with familiarity and experience, it is no surprise that individuals are easily disorientated in 'new' environments, and their identification speed slows down. While modern scientist in the forest would be interested in the 'unknown' plants with the objective of documenting the whole botanical world, the Digo is interested in only the 'known' plants that have a 'value' to them. Additional knowledge such as features useful for identification of other species is appreciated if this adds a new 'value' to their life, but knowledge on its own is not considered a 'value'.

CHAPTER FIVE
TRADITIONAL PLANT NAMES AND NAMING PROCEDURES AMONG THE DIGO

5.1 INTRODUCTION

In this chapter, semantic analysis of Digo plant names is carried out and guiding principles in Digo plant naming are discussed. The discussion is based on botanical and semantic analysis of a corpus of about 380 Digo plant names (Appendix VI) that were recorded during the field work of this study, and supplemented by data from previous studies by the author (Pakia 1997). The analysis was complemented by inquiry with elderly Digo speakers on the meanings of the plant names. The primary aim of this chapter is to present insightful commentaries on the basic plant names from a Digo linguistic perspective, in relation to the respective plant features and values, and to unravel the principles underlying plant naming procedures in Digo. The Digo plant names in the text are given with their meanings in brackets, but without respective botanical names. The reader is recommended to refer to Appendices III and VI. The subject is discussed along topics that are understood as principal in the naming process, as follows:

- Form of Digo plant names - words and phrases forming Digo plant names
- Semantics of plant names – meanings and aspects of naming
- Comparative aspects - synonyms, loans, inherited terms
- Conclusion

5.2 FORMS OF DIGO PLANT NAMES

5.2.1 Simple words forming Digo plant names

The Digo words forming plant names are nouns, and like other nouns, consist of a prefix and a stem. The following is a discussion on the prefixes and stems related to plant names.

Prefixes in Digo plant names

Most prefixes[3] in Digo plant names are of class pair 3 - 4 i.e. *Mu_*, *M_/Mi_*, which are primary prefixes (c.f. Appendix III; Appendix VI), and these account for 80% of the analysed

[3] In the text prefixes, when written independent of the rest of the word are followed by a dash e.g. *Chi_*, and affixes are preceded by the dash e.g. *_ziya*.

corpus of Digo plant names in this study. In addition to primary *Mu/Mi* prefixes, there are secondary prefixes that replace the primary prefixes to express diminutive or augmentative sizes of the plants. For example the labels – *Chiuyu, Muuyu* and *Dziuyu* - all refer to Baobab of different sizes, with *Chi_* and *Dzi_* being the secondary prefixes that express small and large, respectively. The augmentative prefix *Dzi_* is interchangeable with prefix *Li_* for climbers i.e. *Libugu* or *Dzibugu*, but in other plant life-forms the prefix strictly remains '*Dzi_*'. The diminutive prefixes are also primary prefixes in class pair 7- 8 (*Chi/vi*), and this agrees with the observation that these prefixes do not express diminutive size of plant in all cases. There are some plant names in which *Chi_/Vi* do not imply size factor, which range from trees to herbs. About 16% of the corpus has the prefix *Chi_* in a sense that does not denote size, example of these names are given in Table 6.1. In some plant names, however, the size connotations of *Chi_* are metaphorically related or coded, as is indicated in Table 6.2.

Prefixes in unmarked[4] sizes of some plant names are neither *Mu/Mi* nor *Chi/vVi*, and can be considered to be in class pair 9 - 10 (*Nasal/Nasal*), but such plant names maintain the prefixes *Chi* and *Dzi* for their diminutive and augmentative sizes respectively. About 13% of the names in the corpus were of this type, and their examples are given in Table 6.3. Some of the prefixes in class pair 9 – 10, have female gender connotations borrowed from personal names of humans. Digo is not a gender Language (cf. Chapter 3), thus prefixes in plant names and other nouns are not grammatical gender distinct. However, there are primary semantics functioning as references to the sex of a person in human beings. Some Digo plant names have prefixes whose semantics connote 'female' gender, e.g. *Nchibandu, Nchikoma, Nchivuri* and *Nchidoka*; including some fungi names: *N'kuvi, Nimaziya, N'chibalazi, Nimakoba,* and *Nimahembo*. This is probably a general lexicon for non-gender languages, as a similar observation was made by Rottland (2003) for the Southern Nilotic languages in Kenya.

Table 5.1: Vernacular plant names where prefix *chi_* does not reflect diminutive connotation

Vernacular name	Botanical name	Comments
Chiswenya	*Amaranthus* sp.	herb

[4] 'Unmarked' in linguistic refer to terms that have both specific and general meanings relating to a dimension in question. For example in height, the 'unmarked' – tall – in 'how tall is the tree?' does not express predetermined size context that the tree must be tall; but the marked term – short - in 'how short is the tree' presupposes that the tree is short.

Chidori,	*Harrisonia abyssinica*	shrub
Chimwemwe,	*Gardenia volkensii*	shrub
Chitadzi,	*Ormocarpum kirkii*	shrub
Chikombe tsui	*Acacia adenocalyx*	shrub
Chifumai	*Erythroxylon emarginatum*	tree
Chibombo	*Tabernaemontana elegans*	tree
Chikunguni	*Ludia mauritiana*	tree
Chiluwa	*Mkilua fragrans*	tree

Table 5.2: Interpretation of prefix *Chi_* in some Digo plant names

Vernacular name	**Botanical name**	**Rationale of *chi_* in the name**
Chibalazi chanze,	*Tephrosia villosa*	Species named after pigeon pea plant (*Mbalazi*), but is small, hence the *chi_*
Chibambara	*Commiphora lindensis*	A small form of *C. africana* [*Mbambara*]
Chibugu	*Rhynchosia velutina,* *Indigofera trita* *Pleicosepalus parviflorus*	Climbers are identified with the root word *_bugu*, these are small forms, hence the *chi_*
Chidimutsaka	*Toddaliopsis* sp.	Named after Lime tree (*Mdimu*), but it has smaller fruits, hence the *chi_*.
Chidungadunga	*Barleria setigera*	Most thorny species are identified with the root name *_dungadunga*, this is a small form of those
Chikonje	*Stylochiton salaamicus*	Species named after sisal (*konje*) [*Agave*], hence the small size prefix
Chikwadzu	*Cynometra webberi*	Named after Tamarind (*Mkpwadzu*) but considered as a small form
Chiphatsa	*Vernonia hildebrandtii*	Species share the root word *_phatsa* with *V. zanzibarica*, and is small form
Chitsai	*Striga asiatica*	Named after a witch (*mtsai*), but its small size led to the diminutive labelling
Chitsamvia	*Cola minor*	Named after *Synsepalum* spp. (*Mtsamvia*), but because is relatively smaller hence the *chi_*
Chiziyaziya	*Euphorbia hirta*	Latex producing species share root word *_ziyaziya*, its small size is reflected by the *chi_*.

Table 5.3: Examples of Digo plant names with *Nasal* prefix in unmarked size

Vernacular name	**Botanical name**

Futswe	*Asystesia gangetica*
Golonje	*Aloe spp.*
Ganga	*Euphorbia spp.*
Galagala tsui,	*Plectranthus tenuiflorus*
Jirimata	*Pupalia lappacea*
Konje	*Agave sisalana*
Nchikoma,	*Diphasia sp. A*
Nguji,	*Bidens pilosa*
Todza,	*Bidens pilosa*
Nchivuri,	*Blighia unijugata*
Reza	*Solanecio angulatus*
Toro	*Nypmhoides forbesiana*
Vumbamanga	*Ocimum gratissimum*

Stems in Digo plant names

Digo plant names that constitute simple words have stems which are combined with a prefix. The stems of the words in plant name are either 'original' or derived, and while some are simple words, others are reduplicated. Over 60% of the plant names in the corpus analysed in have simple-word stems, of which the 'original' word stems are the most common, accounting for 37% of the corpus. Examples of 'original' stem words are: *_kwadzu, _kadi, _funda, _bondo, _ jafari, _dungu, _kete, _koko, _kwamba, _bokwe* etc. Derived stem-words account for 17% of the corpus, forming the second largest group of the stem kinds. Examples of derived stem-words are: *_nuka* [smell], *_ahira* [sitting on], *_ndiri* [hard], *_tadzi* [crown], *_lumwa* [become sick], *_dhahabu* [gold], *_sabuni* [soap], *_tseketse* [tickle] etc. Reduplicated stems are actually repeating phrases of simple words, and plant names with this type of stem-words account for 7% of the corpus. Examples are: *Chidungadunga* [to pierce], *Chimwemwe* [a smile], *Dokadoka* [to break], *Mziyaziya* [milk]. Reduplicated stem-words in Digo, generally are emphatic on the subject, and for plant names the emphasis is on the referred feature or character of the plant.

5.2.2 Phrase expressions forming Digo plant names

The phrase-expression stems take similar prefixes as simple-word stems, with the same inferences. The phrase expressions that form Digo plant names are of three types, namely genitives, object phrases and noun + determiner. The following is a discussion of each of these phrase expressions.

Genitive phrases

The genitives are phrases that constitute of two nouns with a genitival link e.g. *Chinuka cha m'masai*. The genitival links are characterized by verbal concord or agreement with the class membership of a given noun, and the common genitival links used in plant names are: *cha*, *ra, ga, wa,* and *ya*. Examples of plant names that are genitive phrases are: *Chibalazi cha nze* [pigeon pea of outside], *Humbo ra nguluwe* [stomach of pig], *Mnazi wa nyoka* [coconut tree of the snake] etc. In some plant names, however, the genitive expressions are without the genitival links, e.g. *Chibalazi mlungu*, where the link '*cha*' between the two nouns was dropped to shorten the name. Similar observations are made in: *Konje tsaka* [forest sisal], *Chishikio paka* [cat ear], *Mdimu tsaka* [forest lime], *Ndago munda* [farm sedge], *Vwivwi koma* [wild *vwivwi*] etc. Surprisingly, the majority of the genitive phrases are those without genitival links, while the genitive phrases with genitival links are fewer.

Object phrases

The object phrases consist of a verb and an object e.g. *Chivundza kesi* [case terminator]. The plant names that are of the object-phrase expressions account for 15% of the corpus. Other examples of plant names of the object-phrase expression are: *Mtsonga nyomba* [arrow shaft maker], *Mtsunga ng'ombe* [cattle herder], *Muoza nyama* [meat spoiler], *Munwa madzi* [water drinker], *Mrinda ziya* [water pond protector], *Mlaza koma* [spirits layer] etc.

Noun-determiner phrases

In these phrases the plant name consists of a noun and a determiner e.g. *Toro ndide* [small *Toro*]. In some cases these phrases consist of two nouns, the second noun being the determiner of the first, e.g. *Mtsani ndzovu* [Elephant *Albizia*], where 'elephant' connotes a 'large' size. The 'noun–determiner' phrases accounted for about 10% of the plant names in the corpus. Other examples of 'noun-determiner' phrases in plant names are: *Jirimata chetu*

[female *Jirimata*], *Kongwe lume* [male *Kongwe*], *Libugu pamba* [climbing cotton], *Mbavubavu mkulu* [large *Mbavubavu*], *Mkongolo mwiru* [black *Mkongolo*] etc.

5.3 SEMANTIC ASPECTS OF DIGO PLANT NAMES

5.3.1 Meanings of Digo plant names

Some words that form basic plant names are also commonly used words in day-to-day Digo conversations, which indicate that these are derived names and the sources of their derivation can be easily established. For examples: *Nchivuri* [shade], *Chiahira* [sitting on], *chibugu* [climber], *Chilua* [flower], *Phatsa* [covering], *Chisikolo* [without root base], *Chitsai* [witch], *Chiyuyu* [peeling], *Kalumwa* [never get sick], *Mburuga* [foretell], *Mdhahabu* [golden], *Chinuka* [smelling], *Msabuni* [soap], *Mpira* [rubber], *Msuwaki* [tooth brush], *Mwarubaini* [fourty], *Reza* [neutralizer], and *Phoza* [healing]. Such plant names indicate an attribute or value of the plant, and subsequently suggest the likely naming principle. In the corpus of plant names, about 60% have their meanings interpreted, but the meanings of the remaining 40% are unknown.

On the other hand, Digo plant names that are of phrase-expression forms tend to have part of their meaning being clearer, particularly the attributes which form the second part of the name. However, the meaning of the noun, which is usually the first part of the name, remains unknown. This results in plant names that can only be partially interpreted. For example: *Mtsani tsiye* [small *Albizia*] and *Mtsani ndzovu* [large *Albizia*]; *Ndago-kulu* [large sedge], *Ndago-munda* [farm-land sedge], and *Ndago-ziya* [aquatic sedge]; *Mwinika ngulu* [king-fish *Asparagus*] and *Mwinika ndzovu* [elephant *Asparagus*]. In all the examples above the meanings of the first names, i.e. *Mtsani*, *Ndago* and *Mwinika*, are unknown. These observations suggest that simple-word plant names are older and are the inherited labels retained from proto-Sabaki or even proto-Bantu lexicon. And the phrase-expression plant names are new developments, created by combining old lexicon (the nouns) with attributive expressions, as new observation, differentiation or values in the plant world are made, which call for additional verbal distinctions.

5.3.2 Aspects of Digo plant names and naming methods

The semantic analysis of the plant names (Appendix VI), complimented by ecological and ethnobotanical aspects of the plants, established some guiding principles in Digo plant naming criteria, which can be approximated to adhere to following aspects: habitat, animal reference, gender, size, colour, smell, taste, plant extract, plant habit, plant origin and utility motivation. However, the above listing is not exhaustive, because of the plant names whose semantics are unknown and there are no indicators which guiding principle was followed in their naming. For the rest of the plant species, the assumed naming principles are discussed in the following.

Habitat in plant naming

The habitat of a plant is used in plant naming in 8% of the plant names in the corpus. There are five broad distinguished habitats that are commonly used in plant nomenclature, namely: *koma* [wild], *pwani* [sea], *ziya* [pond], *bara* [hinterland] and *tsaka* [forest]. Other affixes that have habitat connotations but less used are: *munda* [farmland], *mlungu* [God's], *_nze* [outside 'farm']. The labels *koma*, *mlungu* and *_nze* denoted 'uncultivated', thus affixed to crop plant names, referring the wild counterparts. The names of the cultivated ones remain unmarked. For example: *Mbalazi* [pigeon pea] and *Chibalazi cha nze* ['outside' pigeon pea] or its synonym *Chibalazi mlungu* [God's pigeon pea]. *Mtungudza* [African egg plant, cultivated] and *Mtungadza koma* [Sodom's apple, the wild form]. This infers that plants that are not cultivated are 'wild', found 'out' there, and belong to God. However, the affix *_koma* is sometimes cautionary for plants believed to be poisonous or non-edible.

The affix *_pwani* [sea] refers to species that grow by the sea shore e.g. *Futswe ra pwani* [seaside *Futswe* for *Melanthera biflora*], or at least a species that is comparatively 'coastal' to another e.g. *Mkungu wa pwani* [seaside *Mkungu* for *Guettarda speciosa*]. In both examples the plants are named after other wild species which maintain unmarked labels i.e. *Futswe* [*Asystesia gangetica*] and *Mkungu* [*Terminalia cattapa*]. The contrast label for the '*pwani*' is *bara* [hinterland], which refers to species that grow further inland e.g. *Mkoko bara* [hinterland mangrove]. Again species labelled with the affix *_bara* are named after counterpart wild species only to contrast the habitat from unmarked labels, e.g. *Mkoko* [Mangroves]. Species found in fresh water areas e.g. water ponds, are labelled with the affix *_ziya* [water pond] e.g. *Ndago ziya* and *Mrinda ziya*. Also *Mnwa madzi* [*Trichilia emetica*], which translates to 'water drinker' carries the connotations of a species with affinity to water. Some species are designated

as 'river' species e.g. *Mng'ambo* [across the river] and *Mtanga muho* [*Mtanga* by the river]. The latter is compared to *Mtanga* [*Spirostachys africana*] which grows away from rivers.

The labels *_tsaka* [forest], *_tsakani* [in the forest] and *_mwitu* [forest], refer to species that grow in forest areas. There are reservations for the label *_mwitu*, as it is of Swahili origin, and probably the plant names with this term are loans. All the species designated as 'forest' types, are termed after unmarked plant names that are either domesticated or grow in non-forest environment such as grassland. For example, forest species *Mwembe tsaka* [Forest type mango] is named after domesticated *Muembe* [Mango tree], and forest species *Mphanva tsaka* [Forest *Mphamva*] is named after *Mphamva*, which is a grassland species (Beentje 1994). The differences between the affixes *_tsaka* and *_tsakani* in plant names is only syntactic; where genitival link is not used in the former, but is used in the latter e.g. *Muizu wa tsakani* [forst Banana], otherwise their semantic is exactly the same.

Animal references in plant naming

Names of animals (mammals, birds, fish, reptiles, insects etc.) are used in naming plants, which has a range of interpretations, including: an association with the animal, physical simulation, metaphorical size inference, cautionary warning, or utility. In the corpus of plant names, however, the interpretation of the animal names in some plant names could not be immediately established. An association implication between plant and animal is carried in names such as *Mkalafisi* [where hyena stays]. The named species (*Tetracera boiviniana*) is believed to be an indicator of an area preferred for residence by hyenas. On the same note *Mnazi wa tsozi* [sun bird's coconut tree] designates the plant (*Erianthemum curvirameum*) as an important one for sun bird hence visit it frequently (for its flowers)[5]. A simulative reference between an animal or its body part with the plant or plant part is noted in names such as: *Chikombe tsui* [Leopard's claws], where the thorns of the species (*Acacia mellifera*) are compared to the claws of a leopard. In *Chishikio paka* [cat's ear], the leaves of the plant (*Cissampelos pareira*) are compared to the ear of a cat. However, both *shikio* and *paka* are Swahili terms, suggesting the name might be a loan.

The animal name *ndzovu* [elephant] denotes large size in plants comparative to another plant. Thus *Mtsani ndzovu* [*Albizia versicolor*], *Mwinika ndzovu* [*Asparagus* sp.] both refer to the

[5] The Digo consider the coconut plant as very important, and is inferred on the same for this species to the sun bird, because of the frequent visits.

large types of their kind. Animal names as cautionary 'codes' in plant naming are found in *Mnazi wa nyoka* [snake's coconut tree] depicting the poisonous potential in the labelled species (*Scadoxus multiflora* and *Siphonochilus brachystemon*) as being comparative to that of snake. Also the plant name *Muolaga kuku* [chicken killer] sends warnings that the species (*Holarrhena pubescens*) is poisonous. However, what is described as poisonous in Digo perspective might not be recognised with the same status in scientific botany.

Animal names are also used to name plants on bases of use e.g. *Mvua pweza* [fishing octopus] is so called because sticks of the species (*Ochna thomasiana*) are used in octopus fishing. The same is true with *Mvua koe* [fishing '*koe*' – a kind of crustacean] for the species *Pluchea sordida*.

In some cases the rationale of animal names in the plant naming is not clear. For example in: *Mgwanyahi* [fall buffalo] for *Xylopia parviflora*; *Mgongolo* [Millipede] for *Hoslundia opposita*]; and *Mtsalafu* [black ants] for *Cassia occidentale*].

Gender in plant naming

In the Digo understanding, plants are naturally female (cf. Chapter 3), thus unmarked plant names usually refer to the 'female' type. Counter part male plants are commonly marked with the affix *_mlume* [male], and only in few instances are the females are also marked (*_mchetu*). The only male plant that is known to occur naturally is the male papaya, otherwise 'male' is a product of malformation or old age, i.e., when a plant does not or no longer produce fruits.

Male – female designations in plants are also made on the bases of the size of the parts. Large plant parts are considered as masculine, hence found in 'male' plants; while small parts are considered vulnerable and feminine, hence found in 'female' plants. However, as for flower and fruit the larger size of these is feminine and the smaller size is masculine. Examples of the above designations are notable in: *Mgweni mcehtu* [female mgweni] and *Mgweni mlume* [male mgweni] are differentiated by the 'male' (*Uvaria lucida*) having broader leaves compared to the 'female' (*Uvaria acuminate*) (Beentje 1994). But *Kongwe chetu* [female kongwe - *Commelina bracteosa*] has large, deep blue flowers compared to *Kongwe lume* [male kongwe - *C. forskaolii*] which has smaller and less colourful flowers. On the same note *Ndago chetu* [*Cyperus* spp.] has an inflorescence with relatively longer spikelets compared to *Ndago lume* [*Mariscus* spp.]. In the name *Mkambavitu* [*Flueggea virosa*], *vitu* [things] refers

to the fruits in this species, which are white and more visible compared the male counterpart *Mkpwambalungo* [*Phyllanthus reticulatus*]. *Mgweni mlume* [*Male mgweni - Monanthotaxis fornicata*] is also known as *Mgweni madevu* [hairy *Mgweni*], meaning 'hairy' state in plants is also considered as a male feature. The spikes of *Cenchrus mitis* are sharper compared to *Pupalia lappacea*, hence the labels *Jirimata lume* [*Cenchrus mitis*] and *Jirimata chetu* [*Pupalia lappacea*], which means 'sharp and dangerous' features in plants are male related, while 'gentle and harmless' are female related.

Size aspects in plant naming

There are only two size categories, *kulu* [large] and *ndide* [small], and these are applied to plant naming on the basis of the size of their parts, particularly the leaves. Thus *Mngweni mdide* [*Uvaria acuminata*] is in reference to its small leaves compared to *Mgweni mkulu* [*U. lucida*]. The same applies to *Mbavubavu mdide* [*Premna resinosa*] and *Mbavubavu mkulu* [*Grewia forbesii*]. A slightly different label is *Mriga yeri* [*Dioscorea* sp.], which is assumed to refer to a small type of the unmarked *Mriga* [*Dioscorea dumetorum*], but this remains to be confirmed.

Colour reference in plant naming

Mainly only the basic colour terms (Berlin and Kay 1969), *_iru* [black], *_ereru* [white] and *kundu* [red], are used in the plant names and general plant description (cf. Chapter 3). However, *Mdhahabu* [Golden] is also a colour term used in plant naming, referring to the 'golden yellow' stem of the species (*Maclura africana*). The focus on colour for plant naming is mostly the bark and occasionally the colour of flowers for wild species. Thus *Mlala mwiru* [*Diospyros kebuyana*] and *Mlala mwereru* [*Monodora grandidiera*] are differentiated on the basis of the colour of their stems, as black and white respectively. *Mkongolo wa kundu* [*Combretum paniculatum*] is considered as the 'red' type of the unmarked *Mkongolo* [*C. schumannii*], but the focus here is on the flowers, which are 'deep red' in *C. paniculatum* (Beentje 1994). However, for crop plants the naming focuses mainly on the colour of fruits e.g. *Mnazi mwiru* [black coconut tree], *Mnazi wa kundu* [red coconut tree] and *Mnazi wa chisamli* [Yellow coconut tree], are all labeled and differentiated on the basis of the colour of their fruits.

Smell features in plant naming

Plant names maintain only the old label *nụụk* (common Bantu) modified to *nuka* in today Digo, which is unmarked term for smell. Thus *Chinuka* [*Clerodendrum incisum*] is named after its 'strong smell', but *Mnuka lovu* [*C. glabrum*], is named after its 'unpleasant smell'. *C. glabrum* is also known as *Chinuka cha m'masai* [the smell of the Masai], probably associated the historical 'unpleasant' relation of the Digo with the Masai. The plant name *Mkota wongo* [stimulating the brain] also has smell inference, indicating the smell in the species (*Grevea eggelinga*) leaves which send a strong pungent when crashed and sniffed.

Taste features in plant naming

Like smell, only the common Bantu term *cungu* [bitter] modified in today Digo to *utsungu* (but maintaining the same meaning), is used in the plant naming. Thus the plant names *Mtsunga wa utsungu* [bitter vegetable] for *Launea cornuta*, and *Chihumbo utsungu* [gall bladder] for *Phyllanthus amarus*, indicate the bitter taste in these plants.

Special plant habits in plant naming

Plants are also named after some notable habits, particularly those associated with their growth features e.g. the epiphytic plants are collectively labelled as *Chiahira* [sitting on others], which simulates these plants with a chicken sitting on its eggs (*_ahira*). Some plants are named after their rigorous growth habit e.g. *Mfungasanzu* [closing pile] for *Garcinia livingstonei* due to its blocking growth style; and *Mfunganyama* [tangles animal] for *Schlechterina mitestemmatoides* due to its twining. Because of growing tallest in the forest, *Xylopia parviflora* is known as *Mwahula tsaka* [breaking the forest canopy].

Utility values in the plant naming

In the list of 380 plant names, about 20% of the names are related to utility value, including the cautionary names, i.e. for species to be avoided in utilization. The plant naming on the basis of utility is more common for species important for medicinal and magical value (Pakia & Cooke 2003b), which account for over 50% of the names related to utility in the list (Appendix VI). The plant names connoting medicinal-magical values include names of the diseases, the source of ailments, and the result of cures or treatments. For example the names

Mdege [evil eye], *Mbavubavu* [convulsion affecting rib-cage] and *Mdzongodzongo* [stomach ailment] are labels related to diseases. *Mwanga jine*, *Mwanga*, *Punga hewa*, *Chirehani* refer to the spirits that activate the ailments for which the species are used as a cure. *Muurusa pungu* [scare off *Pungu* – a 'spiritual' bird believed to causes convulsions], the species is used to chase or scare off the source of disease from the victim. Plant naming signalling the medicinal-magical outcome on using the species include: *Mtseketse* [amuse], *Chimwemwe* [smile], *Chivudza kesi* [case terminator], *Mvundza kondo* [war terminator], *Mbundugo* [extra strength], *Phoza* [heal], and *Reza* [neutralizer].

Other utility values used in plant naming are domestic values, where names indicate the use, the product obtained, or a warning against use. General use labels include *Msasa* [sand paper], *Mbangula mavi* [faeces cleaner], *Mtsusa tsalu* [beads cleaner], and the respective species are used as their names indicate. Plant product naming is found in *Mtsonga nyomba* [arrow shaft maker], *Mtsonga mwiko* [cooking stick maker], *Msabuni* [soap], *Mvwiko* [floaters], *Mutsi* [pestle], *Msuwaki* [toothbrush], and *Msusu* [bird trap]. For all these, the species in question is used for making the respective domestic item in their names. Plant naming to code a warning ('do not use this species') include fixed labels that are commonly associated with prohibition for real or arbitrary unpleasant outcome, e.g. *Mzigande*, where etymology is unknown but tags it as a poisonous plant. Other 'poison' cautionary labels have been mentioned earlier i.e. *_koma*, *_wanyoka*, and *_olaga* (cf. section on habitat and animal references respectively). Warnings other than of poison are given e.g. by *Mfumula ndolwa* [a home 'breaker'] because this species leads to quarrels and breaks homesteads[6] once used. *Mpamapama* [nose wounds] causes the nose wounds when used for firewood, and *Chiyuyu* [peeling] causes itch and peeling of skin on contact. *Chitsai* [witch], *Striga asiatica*, tells the farmer that this species prevents a good harvest of his crop, particularly maize.

Un-analysable plant names

As noted earlier, a considerable percentage (40%) of the plant names in the corpus are unanlysable. Surprisingly the unanalysable plant names include some of the most common and widely known and utilised species, e.g. vegetables (*Futswe, Mnavu, Mrenda,* and *Demu*), popular medicines (*Golonje, Mchinjiri, Mdungu, Mkone,* and *Muhumba*), species for weaving (*Mlala, Chitsapu*), popular timber species (*Mbambakofi, Mkoko, Mkongolo, Mleha, Mnyendze*

[6] This is better understood from the Digo perspective where traditionally a large family comprising of grand-parents, parents and grand-children form several small families that live together in the same compound, and if they separate, usually due to misunderstanding, the homestead is described as 'broken'.

and *Mrihi*), and edible fruit species (*Mbokwe, Mbungo, Mbalazi, Mfudu* and *Mkpwakpwa*). Considering the high proportion of these plant names, the commonality and utility values, to assume that all these are loan names from other languages would be unrealistic. Further, about half of the unanalysable plant names, the Digo share with other *Midzichenda* (Giriama and Duruma) and Swahili (Appendix VI), which is supportive of the argument that these names are inherited labels. More discussion on inherited plant names is presented in section 5.4.4 of this chapter. In Table 5.4 a summary of the references made in the corpus of 380 plant names (Appendix VI) is given.

Table 5.4: Summary of references in Digo plant names (n=380). (Reference cases are presented in the same order as presented in Appendix VI)

REFERENCE CASE	OCCURRENCE (%)
Habitat	8
Animal	9
Male-Female (Gender)	5
Colour	1
Size	2
Taste or aroma	2
Growth habit	12
Utility	17
Unanalysable	44

5.4 COMPARATIVE VIEW ON DIGO PLANT NAMES

5.4.1 Plant synonyms in Digo

Amongst the Digo some plant names are relatively 'common' but others are strictly 'professional'. Although most local professional groups identify few plant species with names not common to the rest of the community, the Digo healers are particularly the most secretive in their plant naming, thus medicinal plants commonly have two names, the ordinary name and the professional one. For example: *Mkulukazingwa* [the great is never disobeyed], is the commonly known *Muuyu* [*Adansonia digitata*]; *Mtengedzi* [meaning unknown] for what is commonly termed as *Mdzongodzongo* [*Catunaregam nilotica*]; *Mnyinyi* [shiny leaves] is commonly known as *Mchizatsaka* [*Xylopia parviflora*]. *Mtere* [meaning unknown] is to the ordinary *Mburuga* [*Caesalpinia bonduc*], and *Mpingwa* [opposer] is the common *Mchinjiri* [*Dichrostachys cinerea*]. Instead of *Pamba mwitu* [*Gossypioides kirkii*], the healer use the

name *Mngagamwe* [meaning unknown]. The list is certainly longer but the healers are usually hesitant to divulge much of their professional secrets.

Among the Digo speakers, there are notable differences in some plant names due to dialectical differences in phonology in the Southern and the Northern Digo (cf. Chapter 3), particularly resulting from an interchange of 'l' and 'r' that leads differing pronunciations for plant species such as: *Mtserere* (North) and *Mtselele* (South); *Nchivuri* (N) and *Nchivuli* (S); *Chinyakore* (N) and *Chinyakole* (S) etc. In addition, there are major variations in the names of some species between the local populations. These include:

Maize (*Zea mays*) -	*Matsere* (N) and	*Mapemba* (S);
Banana plant (*Musa* spp.) -	*Mgomba* (N) and	*Mkoo* (S).
Devil's weed (*Lantana camara*) -	*Mjasasa* (N) and	*Mtsambala* (S).
Mkilua fragrans -	*Chiluwa* (N) and	*Chingade* (S).

Although some plant synonyms are shared among all Digo e.g. *Mshomoro* [*Lantana camara*]; *Mdizi* [banana plant]; *Mbibo/ Mkorosho* [cashew tree] and *Mlimau/ Mkapu* [lemon tree], there were no immediate explanations for the lexical variations between the Southern and Northern Digo, but contacts and influence from different communities (Tanzanian in the South, and Swahili and other *Midzichenda* in the North) can not be ruled out. What clearly emerges here is a linguistic variation within the Digo, which call for an investigation into historical and current relationship between *Midzichenda* languages (Rottland & Gosserhode 2004).

5.4.2 Innovations of plant names by the Digo

Since languages are impervious, lexical borrowing are common from cross-linguistic influence (Winfred 2003), and the Digo are no exception, but it seems innovations in plant lexicon are preferred to loan labels. Wild plant species are always dubbed as '*kama* _' [looks like _], hence a name is innovated from existing lexicon for a 'newly' discovered plant. In recent history plants which have been introduced have been given vernacular names such as *Mwarubaini* [neem], *Msukukuu* [*Delonix regia*] and *Mkayamba* [*Cassia* sp.]. The naming *Mwarubaini* is based on the belief that the species cures forty (*arubaini*) diseases. *Mkayamba* refers to pods produced by the species that resemble the *kayamba* (a rattle musical instrument). And *Msukukuu* has the notion of the species flowering on *sikukuu* (holy days). Other innovations refer to the useful substance in the species, e.g. *Rangi* [colour] for *Bixa orellana*, *Utsungu* [bitter or poison] for *Acokanthera schimperi*], and *Mpira* [rubber] for

Landolphia kirkii. These labels are Digo words with specific meanings, but have had their meanings expanded into the plant world as to be used as plant labels.

In agriculture, innovations for hybrids and cultivars have been through labelling the new entries as *_rachizungu* [English type] or *_rachigirikacha* [modern agriculture type]. Consequently the old or local type is re-named as *_rachidigo* [Digo type]. This naming criterion is common for fruit crop plants such as mangos, oranges, pineapples, and guavas, e.g. *Pera rachidigo* [small fruiting and common guava cultivar], and *Pera rachizungu* [a larger fruiting, relatively new guava cultivar].

5.4.3 Loan plant names in Digo

New plant species, wild or cultivated, that are introduced to the Digo and do not have a close resembling counterpart, have been adopted with their 'new' names. Thus there are ordinary loans for some plant names (Table 5.5), which will most likely be naturalised after some time.

Table 5.5: Examples of Loaned plant names in Digo

Digo name	**Botanical name**	**Donor language**	**Original name**
Kabichi	*Brassica oleracea var. capitata*	English	Cabbage
Mtiki	*Tectona grandis*	English	Teak
Mvinde	*Casuarina equisetifolia*	Swahili	Mvinje
Mkasuarina	*Casuarina equisitifolia*	English	Casuarina
Epoli	*Mangifera indica (variety)*	English	Apple
Bikisa	*Bixa orellana*	English	Bixa
Karuti	*Daucus carota*	English	Carrot
Mjhafari	*Zanthoxylum*	Swahili	Mjafari
Mwasimini	*Jasminum*	Swahili	Muasumini

5.4.4 Inherited plant names in Digo

Plant names that are in agreement between the major *Midzichenda* groups (Digo, Duruma, and Giriama) and the Swahili, are interpreted as inherited from common Bantu or proto-Sabaki. In the corpus of 380 plant names, the Digo share 40% with at least one of the above named groups. And about half the Digo plant names of unknown origin or meanings are also shared, which qualify to be considered as inherited names whose meanings have been lost with time. However, the *Midzichenda* and the Swahili form a dialect continuum that has led to closeness and mutual intelligibility between languages that allows for easy transfer, so that

contact phenomena are not always clearly distinguishable from genetic heritage. Thus while the assumption that these are inherited plant names is favoured in this thesis, more studies are needed to establish this conclusion. Out of the three ethnic groups the Digo shared about one-third of the names with the Durum, one-fourth with the Swahili and one-fifth with the Giriama. However, these numbers should be understood as estimates, because there was no enough reference material for a thorough compilation.

5.4.5 Digo plant names shared with science and the West

Three Digo plant names have a coincidence agreement with scientific or western lexicon for the same species. These are: *Chilua, Mlangilangi* and *Chitsai*. The scientific name *Mkilua fragrans* derives its origin from its Digo name, *Chilua*, which is endemic to the Kenya Coast (Beentje 1994). The English vernacular name Ylang-ylang for *Cananga odorata*, was adopted in Digo as *Mlangilangi*, after it was introduced for cultivation and then it went wild at the Kenya Coast (Beentje 1994). *Chitsai* [witch] for *Striga asiatica* has a more interesting coincidence. This species is known as 'witch weed' in English, *Teufelszwirn* in Germany [devil] and *Strega* [witch] by Italians. The Swahili name for *Striga* is *Kichawi* [witch] (Heine & Legère 1995), and the Latin designation, *Striga*, refers to a wild female human being with magical powers (Rottland & Grosserhode 2004). This is a special case different from *Chilua* and *Mlangilangi* as the sharing is in the meaning but not the name as such. All the languages concur with the 'witch-hood' of the species. The coincidence of 'witch connection' for *Striga*, and its linking of Africa with Europe is a subject of curiosity, because the coincidence is evidently not resulting from cultural contact or influence.

5.5 CONCLUSION

The above discussion is a testimony on the rich and varied plant names in Digo. The names range from simple words to complex phrases, and from old labels to relatively new labels. And the variation is also noticeable in the semantics of the names. A close scrutiny of the Digo plant names leads to several conclusion, all indicative of the intimate relation between the Digo and their plant world, both in language and practice.

The Digo plant names summarise the perceptions of the Digo on their plant world, thus giving a quick indication of basic knowledge on the subject. These include the understanding of plants not in isolation but as part of a related system (ecosystem), forming an association with

other environmental components e.g. habitats, animals, and even super-natural beings (i.e. spirits), which are in one way or another expressed in the plant names. To expression such understanding, the Digo show that they have been, and continue to be, observant of what unfolds in their environment. The aspects selected and related verbally to the plant lexicon, e.g. animal names, reflect their importance in the life and culture of the Digo. For example, plant names labelled as indicators of the residence of hyena [*Mkala fisi*] is indicative of the importance to understand where this animal stays, so as to avoid the area, particularly for herdsmen, unaccompanied women and children. The observational character is also indicated in the understanding that plants are useful, but there are some that are harmful (poisonous or spiritually evil) and should be avoided. The uses and the warning to avoid using are all expressed in the plant names.

In the expression of use values in plant names, the Digo virtually indicate their main socio-economic activities in the plant names. These include farming, where *Chitsai* [*Striga asiatica*] is related to maize production, and *Mvundza jembe* [*Allophylus rubifolius*] is cautionary to the farmer on the damage the stumps of this species could do his hand hoe (Appendix VI). While in fishing *Mvua pweza* [*Ochna thomasiana*] and *Mvua koe* [*Pluchea sordida*] are both related to fishing activities. The Digo also practice wild mammal hunting, and this is indicated in the name *Muoza nyama* [*Turraea floribunda*] which promises the hunter that using this species for traps guarantees finding his catch.

As much as the Digo plant names express their understanding of nature and their socio-economic activities, the names also give a summarized impression of their hidden cultural fair, such as their beliefs. The presence of considerable plant names that have a reference to spirits and spiritual powers e.g. *Mwanga*, *Mwanga jine*, *Punga hewa*, *Muurusa pungu* etc (cf. Appendix VI), is evidence that the life of the Digo revolves prominently around the belief of super-natural beings, with substantial indulgence in magico-medicine.

Digo plant names also indicate that the Digo plant knowledge is active. While old labels are maintained (sometimes modified), new labels are also included, either through innovations or loan from other languages. This suggests that the knowledge is adjustable to new demands in the society, a factor that is necessary as new priorities are continuously found with time. However, a unique and one of the important observations in Digo plant naming is that there are guiding principles. Both old labels and recent innovated plant names adhere to this guidance. The fact that some plant names are centuries old, going by linguistic historical

evidence, yet in the innovations the unwritten traditional guiding principles in plant naming continue to be followed today, is a surprise revelation. However, despite these interesting observations derived from the analysable plant names, the presence of a considerable un-analysable plant names calls for further investigation in the subject.

CHAPTER SIX
DIGO PLANT CLASSIFICATION AND ASSOCIATIONS

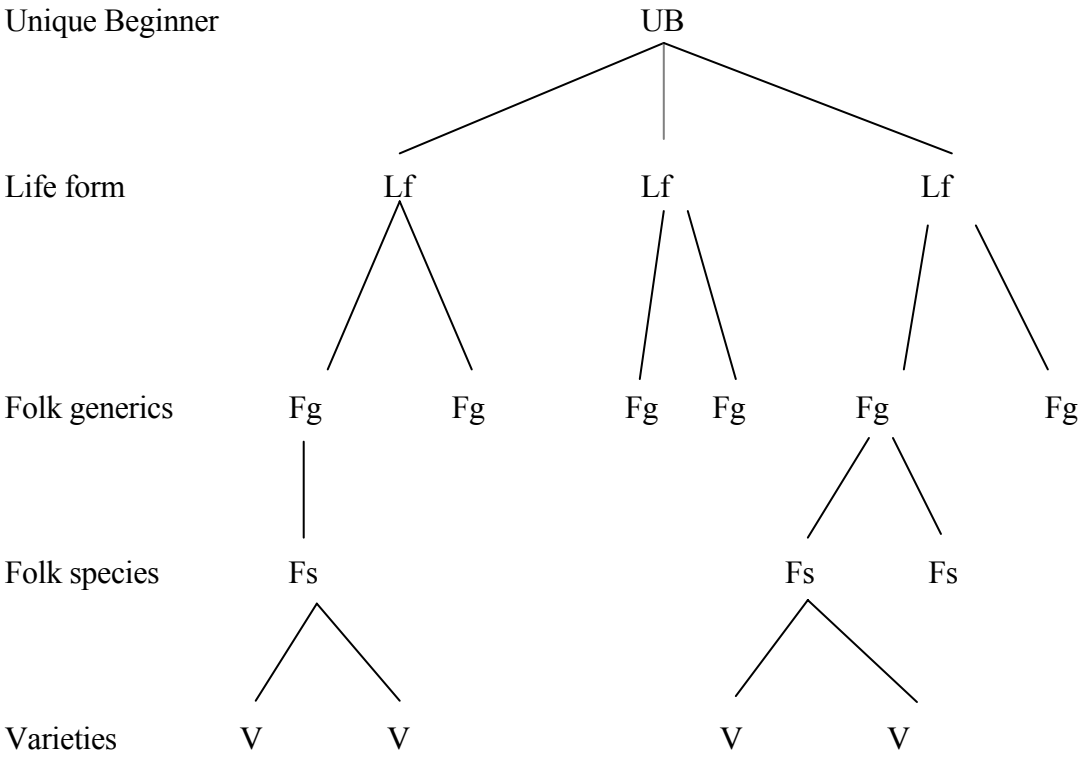
6.1 INTRODUCTION

After having presented the Digo plant lexicon and identification in the previous Chapters, it is appropriate at this point to examine how the Digo order their plant world, i.e. how they classify their plant diversity and typify their vegetation. In writing this Chapter on plant categories, the author used scientific botany and linguistic aspects as guide lines to interpret and present the findings. The Chapter starts with some theoretical aspects and gives an overview of the relevant literature on folk taxonomy, followed by a comprehensive description of Digo folk taxonomy. Finally, the issue of non-classificatory plant groupings in Digo plant knowledge is discussed.

6.2 THEORETICAL ASPECTS AND LITERATURE ON FOLK TAXONOMY

All human societies respond to the diversity of plants and animals in their areas by grouping them into categories of greater or lesser inclusiveness (Brown 1984). In previous studies, ethnographers (Berlin 1992, Berlin *et al*. 1973, 1974) reported universal tendencies in folk taxonomies, which apparently show considerable cross-language uniformity. The core of Berlin's proposal of 'general principles of classification and nomenclature' in folk biology is the concept of ethnobiological ranks, or what Krifka (2001) refers to as nodes, estimated to range between 5 – 6 ranks. Following the introduction of the 'general principles of classification' of folk taxonomies and its descriptive framework, most subsequent studies on the subject have presented more or less similar results, adopting Berlin's schematic relationship of ethnobiological ranking and hierarchical levels, termed as 'the idealized folk taxonomy' (Fig. 6.1). However, since different speakers may entertain different taxonomic features (Krifka 2001), the subsequent studies have indicated differences in the number of ethnobiological ranks but always maintained above five. There are different theoretical postulations that have been made to explain the category recognition by the pre-literate communities.

Fig. 6.1: Schematic relation of ethnobotanical ranks in Berlins's idealized folk taxonomy



Utilitarians such as Malinowski (1974) argue that pre-literate people think through their stomach, i.e. they discriminate the natural world into useful or useless plants (and animals), primarily on the bases of edibility. In the 'utilitarian view', folk taxonomic systems are influenced by goals, theories, and belief systems, and are cultural-dependent constructions (Hunn 1982; Ellen 1993).The alternative is the 'intellectualist view', where structures of kinds in nature are considered to consist of 'clusters' that are more or less imposed on the minds, leading to correspondence between cultures in the category recognition (Atran 1990; Berlin 1992). Atran, however, interprets agreement between cultures in terms of 'universal properties of mind' rather than the structure of nature alone. Structuralists such as Levi-Strauss (1966) concur with empirists like Berlin and his associates (1974), in explaining the outlook of pre-literate people towards the natural world as being 'primarily intellectual'. However, structuralists and empirists differ in philosophical perspectives, as the two advocate different kinds of intellectual mode. For Levi-Strauss, the pre-literate people are concerned with a mode of thinking that unifies through symbolic logic of diverse aspects in their culture; for Berlin and associates the preliterate are concerned with ordering the world through a criterion based on morphology and structure.

Between the 'utilitarian' and the 'intellectualist' there is an intermediate position (Medin & Atran 1999), arguing that the two views are not necessarily mutually exclusive, and their relative

influence may depend on factors such as rank in the hierarchy (Bulmer 1970). Thus pragmatists like Morris (1984), do not entirely agree with Malinowski, but emphasise that pragmatic concerns are highly relevant in interpreting the nature and structure of folk classifications, echoing some of Bulmer's (1974) early misgivings to ethnologists.

Presented in Berlin's systematic classification structure, most folk taxonomies have been depicted as relatively comprehensive, with five or more ethnobiological ranks. According to Berlin the ranks are: unique beginner, plant life-forms, folk generics, folk species, and varietal level (Fig. 6.1). A classification of animals and plants with this number of levels, and flawless in their systematic relationships may be conceivable in advanced societies. Previously, several authors raised questions concerning the applicability of some aspects of Berlin's framework (Brown 1984). These include Bulmer (1974) who argued that Berlin's generalizations are premature, since they are based on only a small number of well described native systems of plant and animal classification. Brown (1984) disqualified Bulmer's objection, and quoting Hays (1977) explained that, accumulating cross-language evidence for the most part has borne out the core of Berlin's proposals if not all. Putting aside other reservations on Berlin's framework, Bulmer's argument is the one of interest in this study. The 'extensive, comprehensive and well described' classification system forming an 'idealized folk taxonomy' (Berlin *et al.* 1974, pp 26) was not observed by Kakudidi (2004) who studied folk taxonomy of Batoro and Bakinga, in Uganda. Although Kakudidi assumed that his observation of a less comprehensive folk taxonomy could have been due to none exhaustive data, the observations made in the present study suggest that this framework corresponds to facts, at least for the small-scale subsistence cultures in question. Heine & Heine (1988), studying the plant knowledge of the Chamus in upcountry Kenya documented a relatively comprehensive folk taxonomy (for a small scale subsistence culture), however, their introduction of 'new' ranks – sub-life form and super generic, may attract reservations. Notably, investigators reporting 'comprehensive' folk taxonomies are Europeans, and probably their scientific background had sub-conscious influence in favour of elaborate classificatory view. Kakudidi and the author of the current study are indigenous to the respective study groups, and their observations agree with Bulmer's (1974) criticism. The results of the current study are based on field work, as well on personal experience and understanding of the language and the community. Technically, these are complemented by the botanical training, and acquaintance with linguistic and anthropological aspects. While plant science is used as a reference to organise the results and develop interpretations and conclusions, it is still the Digo folk concepts that are discussed and maintained in their untainted form.

6.3 TERMS AND THEIR MEANINGS IN FOLK TAXONOMY

In 'folk biology', semantic issues raise confusion which results from disregard of the fact that some 'words' used as labels for classificatory categories are terms with fixed meanings in scientific botany, and might be different in meaning from the same words in everyday's English (Goddard 1998). Although linguistic and scientific expressions do not necessarily have to carry the same meanings, in a subject like ethnobotany – where biology and linguistic are key subject areas, it is necessary that terminological variations are minimised. In that respect, terms of specific concern are 'genus' and 'species', which have been and continue to be commonly used as ethnobiological ranks in folk taxonomies, probably after having been introduced by Berlin *et al.* (1973, 1974). In the folk taxonomy perspective, these terms have different contexts from those in scientific botany. 'Folk genera' are considered as 'the most stable and basic level of categories' (Goddard 1998) and thus are 'the basic building blocks of all folk taxonomies' (Berlin *et al.* 1974). Since these descriptions coincide with scientific species, 'folk generics' should be viewed as equivalent to the scientific 'species' (Berlin 1992) from a folk perspective. However, the use of 'folk genera' to refer (equivalently) to scientific 'species' rather complicates a conception from the biological view; bearing in mind that these terms were borrowed from biology. Berlin's basis for using 'folk genera' is not clear, but it seems that there is no standard guide in the application of terms in folk taxonomy as there have been several attempts to modify the terms e.g. 'folk species' by Bulmer (1970) and 'generic species' by Atran (1998). Although Atran meaningfully defends his 'new' terminology that 'distinction between genus and species' is not pertinent to local communities, that 'distinction between genus and species is relatively new', and that 'the term 'generic species' reflects dual character', he still maintains the category 'folk species' below his 'generic species' category. It is not clear how Atran's 'generic species' and 'folk species' categories partition. And even more problematic is the sub-division of the 'folk species' (which supposedly is equivalent to sub-species or cultivar levels) into 'folk varieties'; and this is in folk taxonomies, which are relatively less detailed.

In an effort to harmonise the above confusion, in this thesis the unmarked terms 'genera' and 'species' refer exclusively to their scientific meanings. 'Folk generics' and 'folk species' refer to their equivalent hierarchical ranks i.e. genera and species respectively, but from a folk taxonomical perspective. In principle, the category 'folk genera' in this thesis is equivalent to the 'intermediate categories' described by Berlin *et al.* (1973, 1974), whilst 'folk species' here refers to Berlin's 'folk genera' and Atran's 'generic species'. It is not clear what the 'varietal' rank in this thesis would represent between Berlin's 'folk species' and 'varietal', as both are sub-

categories of the 'basic units' (i.e. sub-species or cultivars). But 'varietal' rank in this thesis is on the level of scientific sub-species or cultivars. There is no evidence, at least from the Digo perspective, that the folk classifications have sub-divisions below the equivalent of scientific sub-species or cultivars, which apparently correspond with Berlin's 'varietal'. Heine & Heine's (1988) sub-life-forms are more 'collective terms' of convenience that are not strictly classificatory, and some of their labels in this category are actually labels of plant parts e.g. *miya* [thorns], *maziya* [latex], *maruwa* [flowers] (cf. Chapter 3). While Atran (1990) rejects non-morphologically based categories in the classification, Morris (1984) suggests that terms indicating utility e.g. salt, poison, medicine, food etc. are justified classificatory categories and 'such taxonomies are conceptually not isolate' (Morris 1984: pp 48). What Morris did not consider is that these groupings do not fit into a hierarchical framework because the bases of groupings differ from that of life-forms, and membership cuts across different life-forms. Thus, although the pragmatic dimension is recognised in this study, utility groupings are viewed as 'collective terms' isolated from the life-form hierarchical categories, and hence have been dealt with separately as additional groupings. Brown (1977) rejects unlabelled ethnobiological classes, in this thesis these have been treated as 'covert categories' (categories without terms, but are caognately perceived), because evidence shows the Digo have a significant non-verbalised plant knowledge at their disposal (Cf. Chapters 3 and 4), thus cognate taxonomic categories are acceptable, as long as they can be communicated.

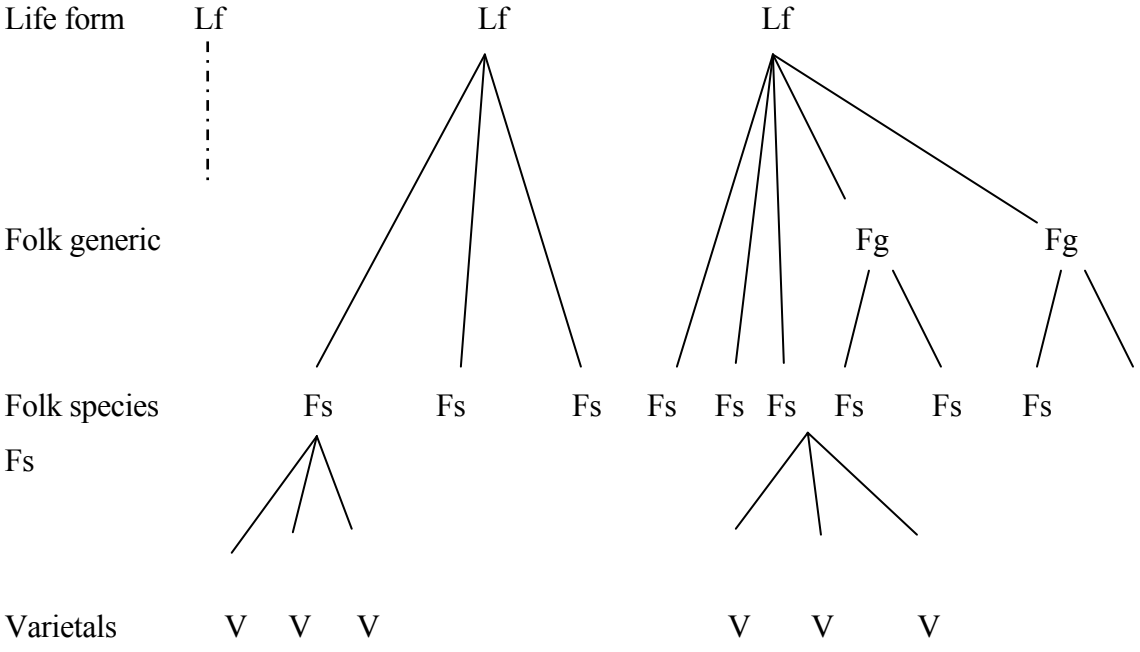
6.4 DIGO FOLK TAXONOMY

Like in other folk taxonomies, in Digo there is no term equivalent to 'plant', i.e. there is no kingdom category, as there is neither label nor a periphrastic expression that refers to the unique beginner. And again similar to the other societies, the concept 'plant' is understood. Due to lack of a label and a description for the 'plant kingdom', it was difficult to communicate and elaborately discuss this category. Thus, 'plant' in this study is treated as only a concept in the Digo plant knowledge and not a taxonomic category.

The Digo folk taxonomy has fewer clearly recognised ethnobotanical ranks, only two, and two additional ranks that are restricted to useful wild plants and crop plants (Fig. 6.2). The categories that are undoubtedly recognised and common in Digo folk taxonomy are: life form and folk species; whereas folk generics and folk varietal are rare and only observable among useful wild plants and crop plants. Although none of these ethnobiological ranks are lexicalised, their respective taxa are labelled and described. Using predetermined examples, respondents allocated

membership to appropriate taxa in the life-form categories, as well as identifying more member examples for each life form category. This confirmed that the life-form categories were perceived, and logically that classificatory rank is recognised. Through analysis of plant names, folk generics, specifics and varietals were notable. However, it is worthy of mentioning here that plant name analysis is tricky and can easily misleading investigators, because some plant names appear to be related but the respective plants are not associates in the classification. On the other hand not all classificatory relationships are obvious in the plant names. Examples of such obscure cases are: *Mnazi* [coconut], *Mnazi wa nyoka* [snake's coconut tree] and *Mnazi wa tsozi* [sun bird's coconut tree], although these labels share the label '*mnazi*', they are not related in the classification. While *Mutsu* [*Avicennia marina*], *Mdzago* [*Bruguiera gymnorrhiza*] and *Mkoko* [*Rhizophora mucronata*], do not share names but are collectively considered as *Mikoko* [mangroves]. Further, *Mkoko bara* [*Sideroxylon inerme*] in the classification is not in the *Mikoko* group. To avoid this problem, investigators need to have thorough understanding of the language, and good intuition and comprehension of the semantic relevance in the plant names, i.e. whether classificatory oriented or simulation from a different perspective.

Fig. 6.2: Summarised schematic relationships of rank categories in Digo folk classification



6.4.1 Categories of plant life-forms

The Digo differentiate three plant life-forms. And as in the other folk taxonomies (Atran 1985, 1990; Berlin *et al.* 1974,; Berlin 1992; Johnson-Gottesfeld & Hargus 1998) the Digo plant life-forms are major plant categories, being polytypic (Goddard 1998) i.e. consisting of several different kinds, and are labelled with simple words, which is common feature in folk taxonomies (Johnson-Gottesfeld & Hargus 1998). The three plant life-forms are: *mihi* [trees and bushes], *mbugu* [climbers and lianas] and *nyasi* [grass + herb]. Life-form classes and the terms used for labelling them tend to be added to languages in a more or less set order (Brown 1984, pp. 318). According to this author the life-form and their terms are added in the following order: stage I language has no life-form category, in stage II one life-category viz. 'tree' appears; at stage III 'grerb ('grass + herb' or 'grass' alone) is added. 'Vines' or 'shrub' appear at stage IV. Based on that order, Digo with three life-form labels is a stage IV language. Based on the descriptions given by respondents, the Digo life-forms are differentiated on the basis of their morphology, in particular the woody condition of the stem and the height of the plant. However, based on the description of each life-form, some plants could not be classified to any of the above three recognised plant life-forms above, and these were put in a separate 'group' that has been labelled as 'unaffiliated' (Berlin *et al.* 1973, Berlin 1992). A fourth life-form, *uoga* [mushroom], will be considered as a provisional category which, however, is still very vague. Mushrooms are obviously not really understood as plants like in other folk taxonomies (Johnson 1999), and as it is in science, i.e. the kingdom of fungi. In the following sections, the life-forms are commented upon.

Mihi

The life-form *mihi* comprise of tall plants with woody stems, and the size of which varies from the height of a person (5 ft) to a forest canopy height (>20 ft). This plant life-form encompasses uni-stemmed as well as multi-stemmed 'trees' which might also be addressed as big shrubs. Because of the woody nature of their stems all palms are included in this life-form. Sisal (*Agave sisalana*) is included in this life-form only after producing its inflorescence (which is used for building). *Aloe* spp. are considered as *mihi* after producing observable stems with a terminal leaf rosette. Of all the plant life-forms, *mihi*, are the most important timber sources (Pakia & Cooke 2003a) for: furniture, house construction, household equipments, firewood, and simultaneously may produce edible fruits. Plants that are potential members of this life-form but are smaller (between 1–2m height) i.e. young trees and shrubs, are labelled with diminutive equivalents -

chidzihi (singl.) or *vidzihi* (pl.). However, this is only at a stage when the nature of the species is already recognisable and has started to produce a woody stem.

Mbugu

Mbugu are lianas and climbers producing twining stems, and scandent shrubs. Their salient character is the ability to climb, but the species must also have a woody stem. Thus ground trailers, twining grasses and herbs e.g. *Commelina benghalensis* and *Cissampelos pareira* are not part of this plant life-form. Members of this life-form e.g. *Saba comorensis, Ancylobotrys petersiana* and *Landolphia kirkii*, are characterised by flexible but strong wood, and thus are used for crafting, mostly of furniture. It should be noted that tropical lianas may develop a stem with several decimetres in diameter.

Nyasi

This plant life-form comprises of herbaceous plants, including grasses, sedges, creepers and very small woody plants lower than 1m. The Digo have a special term for sedges - *ndago*, otherwise most members of this life-form are addressed with the collective term – *nyasi*. Seedlings of trees and shrubs in the herbaceous layer are also considered as *nyasi*. Epiphytic orchid plants (*Anselia africana* and *Angraecum dives*), non-woody trailing plants (*Plicosepalus parviflorus, Commelina benghalensis*, *Cissampelos pareira*) and ground-creepers (*Oxygonum sp. Plectranthus flaccidus* and *Asystasia gangetica*) are also *nyasi*. Although *Hyparrhenia* spp. grows above 2m high, its delicate herbaceous stem and its general grass-like features qualify it for the *nyasi* life-form. In a very general sense *nyasi* may contain connotations of uselessness, except for being fodder. However, specific member species in *nyasi* have ethnobotanical uses (Pakia & Cooke 2003a) e.g. vegetables (*Asystesia gangetica*, *Launea cornuta,* and *Talinum caffrum*), house building (*Cyperus exaltatus, Hyperrhenia* sp. and *Heteropogon contortus*) and making music instrument (*kayamba* – from *Hyparrhenia* sp.). On the perception that *nyasi* are useless herbaceous plants, herbaceous crops are re-labelled as *mimea*, most likely a loan term from Swahili.

Unaffiliated

This is a group of plants that are individually labelled, but do not fit into any of the three plant life-forms discussed above. These include: maize, banana, sisal (before producing the inflorescence), Aloe (ground sitting rosette), sugarcane, cacti, Euphorbia (before producing a stem), and the cassava plant. The non-categorization of these plants was based on their semi-woody stems yet relatively tall features, which Berlin *et al.* (1974) referred to as ‘aberrants’.

These plants have been put in a 'group' that is labelled as 'unaffiliated' (Berlin *et al*. 1973, 1974) to fit them in the hierarchy, otherwise they form single member categories as from life-form level. The fact that these are mainly useful plants and they are individually labelled, suggest that probably their identity by their names replaces categorization.

Uoga

The life-form *uoga* (*vyoga* pl.) comprises mushrooms, particularly referring to fleshy fruiting bodies. There are two distinguished kinds of *uoga*: unmarked *uoga* - which refers to the edible mushroom, and *uoga-koma* - which refers to non-edible or poisonous mushrooms. Despite the abundance of fungal species in the area, and their conspicuous salience in the rainy season, only species which are known to be edible are identified with specific names. All the other species are grossed as *vyoga-koma* [wild/poisonous mushrooms]. Other fungal fruiting bodies e.g. of *Gonoderma* spp. which grow on tree trunks, puff balls, and earth stars were not considered as typical *uoga*, and were not put in any other category. On the other hand, mosses are differentiated from plants by the term *koga*, algae as *likosi*, and lichens are not labelled at all. All these are neither related to plants nor to mushrooms, and have only their respective collective terms without subordinate categories.

6.4.2 Folk generics

Some Digo plant names appear in a sequence such that further categorization is recognisable. Thus through analysis of 'basic' Digo plant names, it is established that the ranking levels folk generics is found in few labels. Digo folk genus is considered to be a group of plants that share their first label (genus name), and each is then differentiated with an additional affix (epithetic name), and the referred taxa are not sub-species or cultivars of the same species in the scientific sense. Based on this analysis, in a list of 390 plant names (Appendix V), folk generics in Digo were noted to be relatively few, representing only 2% of the corpus. In addition, the folk generics are notable among 'useful' species, e.g. timber, medicinal and food plants. However, from experience, some plant names do not maintain the genus label in each taxa, but classificatory view the taxa are understood to belong to the same genus category, e.g. the species *Mutsu* [*Avicennia marina*], *Mdzago* [*Bruguiera gymnorrhiza*] and *Mkoko* [*Rhizophora mucronata*], do not share names but are collectively considered as *Mikoko* [mangroves]. Examples of Digo folk generics are given in Table 6.1

Table 6.1: Examples of Digo folk generics, their folk species and scientific species equivalents.

Digo genus label	**Digo folk species**	**Scientific equivalent**
Bondo [*Panicum*]	*Bondo kulu*	*Panicum maxima*
	Bondo dide	*Panicum* sp.
Ndago [sedges]	*Ndago kulu*	*Cyperus*
	Ndago ndide	*Kyllinga*
	Ndago ziya	*Fimbristylis*
	Ndago munda	*Mariscus*
Mtsani [*Albizia*]	*Mtsani ndzovu*	*A. Versicolor*
	Mtsani tsiye	*A. adianthifolia*
Mngweni [*Uvaria* & *Monanthotaxis*]	*Mgweni madevu*	*Monanthotaxis fornicata*
	Mgweni mkulu or *Mgweni mlume*	*Uvaria lucida*
	Mgweni mdide or *Mgweni mchetu*	*U. acuminata*
Mwinika [*Asparagus*]	*Mwinika ngulu*	*Asparagus* sp.
	Mwinika ndzovu	*A. fulcatus*
Mfudu [*Vitex*]	*Mfudu*	*V. payos*
	Mfudu madzi	*V. mombassae*
	Mfudu unga	*V. doniana*

Although some of the Digo 'folk generics' fit into scientific genera, there are notable cases where membership varies. For example *Mtsani* [*Albizia*] does not include *Albizia anthelmintica*, which instead is known as *Mporojo*. On the other hand *Mgweni* cut across the scientific genera *Uvaria* and *Monanthotaxis*. *Ndago* is estimated to refer to 'sedges' as a whole, putting together the scientific genera *Cyperus, Fimbristylis, Mariscus* and *Kyllinga*.

Commonly, after the life-forms the Digo classification comprises 'folk species', and the 'folk generics' described above are rare. In fact, it is very clear that the Digo do not think of hierarchical categorization below life-forms and above folk species, they are more focused on the basic 'species' level. Cases where closely resembling 'useful' species are differentiated are few. In true consideration therefore, the 'folk generic' level does not form a clearly recognised category in the Digo folk classification.

6.4.3 Folk species

The 'folk species' rank is the most stable level of categorization, and folk species are the basic categories in the Digo folk taxonomy. Folk species are the first possible terminal category, and form the majority of the labelled constituents in the classification. Although some folk species correspond one-by-one with scientific species, other folk species amass more than one scientific species in a label e.g. *Mbavubavu* [*Grewia holstii* and *G. ectasicarpa*] or *Mvundzakondo* [*Allophylus rubifolius* and *Allophylus pervilei*]. In some cases the coalesced species are of different genera e.g. *Mvundzajembe* [*Allophylus rubifolius, Allophylus pervilei, Alchornia laxiflora, Acalypha neptunica* and *Mallotus oppositifolius*]. Or even different plant families as in *chikombe-tsui* [*Acacia adenocalyx* and *Capparis viminea*]. Epiphytes are collectively known as *Chiahira*. Although variations between member species are observable and conceived, the individual species are not distinguished with specific names, and are generally considered as 'one'. Some member species that are coalesced in one folk species, are used indiscriminately for given values, particularly medicinal uses, but others are not.

Probably the interesting questions are why are scientific species coalesced into one 'folk species'? And why some coalesced species share use values others do not? Species coalescing usually revolve between utility and morphology of the respective species. In the above examples – *Mvundza jembe* has utility connotations (species used spiritually in bringing peace) and any member species is eligible to the use. The same is true with *Mbavubavu* (species used to treat rib-cage ailments, particularly convulsions). However, *Chikombe tsui* [Leopard's claws] has structural connotations, referring to the presence of pricks in the species. Thus plants sharing structural features of parts can also be coalesced into one folk species. However, species coalesced on structural bases do not share utility application as in the previous example.

6.4.4 Variant Categories

In Digo folk taxonomy variants are the lowest possible terminal categories. Variants are rare, and exceptionally recorded among crop plants of major cultural importance. Berlin et al. (1974) also documented variants only among important cultivars of the Tzeltal community. In the Digo lexicon crop variants are not a new phenomenon as some of them have been known for centuries. Newly introduced varieties (hybrids or cultivars) have been coined to distinguish their 'new' status using the expression '*_ra-chizungu*' [European type] e.g. *pera ra chizungu* [European guava]. In such situation respective 'old' counterpart variants are re-labeled as '*_ra-chidigo*' [Digo type] e.g. *pera ra chidigo* [Digo guava]. Since variants are

labelled by adding a modifier affix e.g. the *_ra-chizungu* or *_ra-chizungu*, to a basic category label, such as *embe* [mango], *pera* [guava], *nanasi* [pineapple], variant labels are commonly phrase expressions of a 'noun and a modifier' (cf. Chapter 5). However, in day-to-day Digo conversations, the lexicon for some variants may be abbreviated to a 'simple word' labels by using only the modifier. For example, instead of *embe ra boribo*, this is shortened to '*boribo*'. In the following text examples of variants for the crop plants: maize [*Zea mays*], mango [*Mangifera indica*], coconut [*Cocos nucifera*], pepper, simsim [*Sesamum orientle*], cowpea [*Vigna unguiculata*] and paw-paw [*Papaya carica*]) are listed. The highest variants were recorded in mango (18 variants), and least variants were recorded in Paw-paw and Sesame (2 variants each). Most variants for mango were given during discussions without proper descriptions. Thus, in the text their description has been excluded. Readers are also recommended to Appendix VII (Table G.2), where more crop variaties have been presented.

***Kunde* [cowpea] variants**: *Chifumbatele* (has high yields)*, Koroboi* (short type)*, Zonga* (twines extensively) and *Chimakoo* (grows in an erect position).

***Papali* [paw-paw] variants**: *Moyo wereru* (yellow flesh) and *Moyo wa samba* (red flesh).

***Ufuha* [sesame] variants**: *Ufuha mwiru* (with black seeds) and *Ufuha mwereru* (with relatively white seeds)

***Matsere* [Maize] variants**: *Gachidigo* (local variants): *Mwatsaka* (red)*, Maricheni* (yellow)*, Chitweka* (black)*, Tsere ra matungo* (black, red, white pattern)*, Mjundo* (striped patterns), *Mbokomo, Bumubumu* (grows quickly) and *Chifumba tele* (high produce). Others are *Gachizungu* (hybrids variants): *Kosti* (very tall) and *Katumani* (very short).

***Maembe* [mango] variants**: *Chidigo, Chishikio punda, Dodo, Chimaji, Chisukari, Dzunga, Chikunguma, Ching'ongo, Tovu, Zafarani, Ngoe, Boribo, Batawi, Epoli, Faransa, Kasuku, Dobe* and *Sapai*.

***Mnazi* [coconut] variants**: *Mnazi-wachisamli* (deep yellow fruits), *Mnazi-mwiru* (dark green fruits) and *Mnazi-wakundu* (orange coloured fruits).

Fig. 6.3 Assorted local maize varieties recognised by the Digo

Fig. 6.4: Some of the mango varieties recognised by the Digo, (from right to left) – *Ngoe*, *Boribo*, *Batawi*, and *Chimaji*.

Fig. 6.5: The common coconut varieties recognised by the Digo, *Chisamli* (left), *Mnazi mwiru* (middle), and *Mnazi wa kundu* (right)

In Table 6.2, specific examples of the Digo ethnobotanical categories and sub-categories are given for the ranks life-form, folk generics, folk species, and varieties, which show the distribution of varieties in crop plants, and folk generics in selected useful plant taxa.

Table 6.2: Examples of Digo ethnobotanical categories and sub-categories in the folk classification

Life forms	Folk generics	Folk species	Folk varietals
Mihi	Mtsani	Mtsani tsiye	
		Mtsani ndzovu	
	Mdimu	Mdimu	
		Mdimu-tsaka	
		Mnazi	Mnazi wa kundu
			Mnazi mwiru
			Mnazi wa chisamli
Mbugu	Mngweni	Mngweni mlume	
		Mngweni mchetu	
		Mngweni madevu	
Nyasi	Ndago	Ndago munda	
		Ndago ziya	
		Ndago kulu	
Uoga	Nimakoba	Nimakoba mwereru	
		Nimakoba wa kundu	
	Nkuvi	Nkuvi wa mirihin	
		Nkuvi wa mdani	
Unaffiliated		Matsere	Maricheni
			Chitweka
			Tsera ra matungo
			Tsere ra mjundo
		Ndizi	Gojozi
			Chisukari
			Chini
		Manga	Chibandameno
			Chileso
			Mjiriama
			Boto
			Gushe

6.4.5 **Covert categories** (Categories without labels)

In addition to the labelled 'folk generics' there were other cognitively conceived but non-verbalised categories that fit in that level. These include species identified as 'close relatives' '(because of similarity appearance) with the coconut tree [*Mnazi*], listed by respondents as *Phoenix reclinata* [*Uchindu*], *Raphia farinifera* [*Mtsikitsi*], and Borassus *aethiopicus* [*Mvumo*]. However, although each of these species is independently lexicalised, and similarity between them is appreciated, there is no cover term for them. But indications were clear that the category equivalent to 'palms' was recognised only not actively lexicalised. Similarly cognate relations were noted for citrus plants and Acacias. These categories are here considered as 'covert categories', and have been observed in other folk taxonomies (Berlin *et al*. 1973, 1974).

6.4.6 **Non-hierarchical classificatory plant groupings**

Apart from the above hierarchical classificatory levels discussed above, the Digo have other plant grouping expressions that are used to associate or classify plants along utility value, e.g. *Mihi ya kurya* [food plant], *mihi ya dawa* [medicinal plants], *mihi ya sumu* [poisonous plants], *mihi ya kudzengera* [house building plants] and *maruwa* [ornamentation plants]. Other groupings are based on physical structures or secretions in the plants. For example:
Miya [thorns] – refers to prickly plants or 'thistle' e.g. *Chiombe-tsui* [*Acacia adenocalyx*], *Mnyondoya* [*Flacourtia indica*], and *Jirimata*[*Cenchrus mitis*]. Although each species has its specific name, the label is a 'cover' category for all these, and can include even unknown species with thorny structures.

M/Chiziya [milk] – refers to plants producing milk latex (not to be confused with '*ziya*' [lake] as in *Mrinda-ziya* [lake protector]). Species in this group include: *Mziyaziya* [*Hunteria zeylanica*], *Chiziyaziya* [*Euphorbia hirta*], and *Nimaziya* [mushroom *Lacterius* sp.].

There are also collective lexicons for plants with specific characters or growth form. These include *Mwamdzavi* refers to itchy plants (*Tragea furialis* and *Laportea lanceolata*), and *Mbodzembodze* refer to resurrection plants (*Biophytum petersianum* and *Mimosa pudica*). *Chiahira* refers to all epiphytic plants and *Mnazi wa tsozi* refers to parasitic plants.

6.5 ARE DIGO FOLK CATEGORIES RECOGNISED OR CONSTRUCTED

This chapter might be incomplete without contributing to the theoretical issues of folk biology related to folk taxonomy. One such basic issue concerns a clarification as to whether the Digo classificatory categories are recognised or constructed. The observations made in this study indicate that the Digo plant category recognition takes an 'intermediate position' (Bulmer 1974). While intellectual aspects play significant role in higher level categories (life-forms), either through discontinuity of natural kinds (Berlin 1992) or through higher-order cognitive structure of minds (Atran 1990). At the lower levels of the taxonomic hierarchy ('folk generics', 'folk species', and varietals), perception is on the bases of subsistence needs. Thus categories above and below the 'folk species' i.e. 'folk generics' and 'folk varietal' are observable only among useful wild plant species and crop plants.

6.6 CONCLUSION

The features of Digo folk taxonomy suggest a pattern remotely comparable to the scientific taxonomy, and not as comprehensive as other folk taxonomies reported by Berlin and other ethnographers. The 'idealized folk taxonomy' scheme (Berlin *et al.* 1974, pp 26) is too detailed for the Digo folk taxonomy, which have irregular presence of folk generics and varietals. Although the Digo folk taxonomy starts off with broadly inclusive ranks of life-forms that are differentiated on basis of discontinuity of kinds, which is consistent with Atran's rationalism theory, recognition of lower ranks is mainly compelled by value, emphasising perspectives of social reality and practical interests. In the lower categories non-used and less use species are not elaborately categorised. The Digo folk taxonomy therefore combines both intellectual and utilitarian aspects, consequently taking an intermediate position (Bulmer 1970).

Similar to other folk taxonomies (Atran 1995; Berlin 1992), small sized and perceptually less salient plant forms e.g. moss, lichen, fungi and graminoids are under differentiated. Utility in Digo plant groupings is emphasised in groupings that are strictly value related, which disregard morphological features. Membership in such groups is not exclusive, thus a plant could belong to different groups on the same level. Notable in Digo folk taxonomy is the presence of cognate categories that are not lexicalised, which are potential folk generics – such as palms, acacias and citrus plants, labelled in this study as covert categories.

CHAPTER SEVEN
MBEYU, A DIGO CONCEPT IN PLANT PROPAGATION

7.1 INTRODUCTION

In the previous chapters, the knowledge areas covered (plant lexicon, description, identification and classification), are all based on mainly visual morphological characters of the plant. In this chapter, the author attempts to establish the extent of Digo plant knowledge beyond the lexicon, description and categorization. Thus, the cognitive domain of the Digo relative to plant knowledge is investigated in relation to plant processes. Selected for this investigation is the conception of the Digo on plant processes related to propagation. The chapter is purposeful biased to explanations and understanding from a 'traditional' Digo perspective, thus it is mainly the 'intellectual' comprehension of the elderly Digo on the subject (whose knowledge does not originate from school), that forms the core of discussion. Respective scientific explanations, as given by pupils and students, and even some farmers who learnt modern concepts from their advisers, have been largely excluded. The plant knowledge areas focused in the discussion, i.e. plant propagation and development, together form a constituent that can be summarised, from a Digo perspective, as *mbeyu*.

The chapter starts with explanations on the meanings of the term *mbeyu*, and then the Digo interpretations of gender in plants is revisited (gender was briefly discussed in chapter 5). The Digo conception on the developmental process of a selected type of *mbeyu* (the seed) is discussed, and is followed by a discussion on 'how the seed develops to another plant' (seed germination and plant development).

7.2 THE PLANT PART *MBEYU*

The term *mbeyu* is a synonym for *tunda* [fruit] (cf. Chapter 3), and it also refers to: seed, propagation material (of all kinds) and breed type. Propagation materials known as *mbeyu* is inclusive of both sexual and asexual materials, i.e., seeds, vegetative cuttings, suckers of banana plant, seedlings/saplings, and eye buds of potatoes. A fruit containing seeds can also be referred to as *mbeyu*. Since *mbeyu* has the connotations of 'propagation' for the various plant parts, then it can be considered as a functional label. This means, seeds intended for consumption would not qualify to be *mbeyu*. Even seeds or other plant part designated for propagation but proved to be in unviable state would be disqualified from being *mbeyu*. The

term *mbeyu* is actually a cover term for 'propagation material', and individual propagates have specific labels, which are: *vigoda* [vegetative cuttings], *mitse* [seedlings and saplings], *tembe* [seeds], *mwana* [banana sucker], and *dzitso* [eye bud of potato].

In humans and animals, the term *mbeyu* is applied to generative elements, particularly those visually observable e.g. eggs of birds [*mayayi*] or human semen [*mbeyu za chilume*]. However, it seems as the size of propagates get smaller e.g. pollen grains in flowers and spores in fungi, the conception becomes even more difficult to the Digo. No wonder pollens are referred to as *ungaunga* [flour] and their function is largely unknown, while spores are neither labelled nor recognised at all.

7.3 GENDER IN PLANTS

Although the Digo understand and correctly point to some papaya trees as male, the gender connotations here are not similar to those perceived in humans and other animals, and not similar to science either. Although it is known that in humans and in other animals, male and female contribute towards the formation of a progeny, in plant reproduction 'male' is not considered functionally important. Thus the female papaya is understood to produce without any contribution from the male counter part. In fact Digo farmers cut down male papaya, whose only importance was given as the roots being of medicinal interest. In plants, male-female definitions are simple based on fruit production; 'female' produces fruits and 'male' does not. This description of male-female is applied to dioecious plants (as is the case with the papaya plants) as well as to bisexual plants. In bisexual plants, 'female' status changes to 'male' status once the plant stops producing as through age or infection (cf. Chapter 5). Here the implication is that a male status is just like a stage of development, and because individuals progress from one stage to the other, so can they change from male to female and vice versa.

Since plants are generally considered female (cf. Chapter 3 & 5), linguistic phrases applicable to developmental stages of female humans are also applied to respective stages in plants. These include: *msichana* [girl] - the stage just before the first fruit producing period; *inamimba* [is pregnant] - the time when the plant has unopened flower buds; and *inavyala* [is giving birth] - refers to the plant at the time when it is producing flowers and fruits. The stages *msichana* and *inavyala* were synonymously accepted by respondents, but the application of the term *inamimba* in plant life situation was disqualified by some respondents,

who argued that the basis of pregnancy are strictly related to sexual intercourse, which plants 'do not indulge in'. However, there is a common Digo metaphor '.. *nyasi zina mimba* …' […grasses are pregnant …], which means 'you never know who is hiding what (identity)', that strongly gives testimony of *mimba* as an acceptable description in plants.

7.4 THE DEVELOPMENT OF *MBEYU* [SEED]

Although there are different types of *mbeyu*, the development of only one of these is discussed here. The *mbeyu* selected for discussion is the *tembe* [seed]. As a *mbeyu*, the seed is understood as the initial stage of a new plant, and the flower is generally known to be the reproductive part of the plant, from which the seeds are produced. But unlike scientific botany, the Digo have no perception of sexual process (involvement of the male and female gametes) in seed development. Therefore, the presence of male and female gametes in flowers is generally unknown, as indicated by the consideration of *punga* [male inflorescence of maize plant] as indicator of the vigour and maturity of the cob, but not related to the maize reproduction process (cf. Chapter 3). Also *njiyo* [stigma], like *punga*, is only an indicator of the maturity of the cob. One farmer (out of the 40) mentioned of *madzi* [fluid] flowing from the *punga* through the maize stem to the *chowa* [young female inflorescence in maize plant], and two healers (out of 13) believed that plants have sexual relationships via their roots. Although not exactly conforming with scientific understanding, these were the only explanations that underscored participation of 'male' and 'female'. However, even with their 'modern' knowledge the farmer and the two healers could not further explain the male and female identities of the involved plants or plant parts. These explanations were rather unique, reflecting individual arguments and borrowed analogy from human/animal life situation. But on the whole, the common Digo knowledge is that sexual process does not occur in flowers, instead the embryo (visible as a miniature fruit in some flowers) 'grows' by enlarging into the clearly recognisable fruit or seed. But even the processes involved in growth (development of plant matter) for the seed/fruit and the rest of plant parts were unknown, and there was no indication of 'desire to know'.

Although insects and birds are known to visits flowers frequently, the role of the birds and insects was interpreted differently among the Digo, and overall their interpretations were different from the scientific one i.e. insects and birds are pollinators. The role of other potential pollinators (water and wind) was also not recognised. The colourful and conspicuous state of flowers is understood as *marembo* [beauty], a feature associated with the female

gender (and plants are female), contrast to scientific view, has nothing to do with the birds and insects (pollinators) visiting the flower. The explanations of insect-flower relationship were not consistent, and seemed to be personal opinions. From a general view, the explanations are based on benefit or loss between the plant and the insect, as summarised in the following.

Insect protecting the flower - The insect (here specific reference was made to the bee) was described as playing a protective role for the flower against any potential pests, such as caterpillars. In this relation the bee does not profit, because it undertakes the security responsibility on a voluntary basis'. This understanding is likely to be the most shared conception, as its acceptability is traceable in a Digo saying and song '…. *nakala buo narinda maruwa* …' [I became a bee protecting the flower; *buo* is a type of bee], referring to confession of indulging in an unpaid job.

Insect as a 'mechanic' - Other respondents described the 'insects' (all pollinating insects and birds) as 'mechanic' operators removing a certain obstruction in the flower which otherwise inhibits fruit formation and seed development. The 'obstruction' was described as *madzi* [fluid] with inhibitory effects, which the insect sucks to pave the way for fruiting. Probably, *madzi* here refers to the nectar which the pollinators collect from the flower.

Insect as the male counterpart - Since the plants are understood as female beings, and male plants are said to play no role in propagation, the insect (in that respect birds are ignored) is assumed to be the male counter-part of all flowers. The insect is said to 'mate' with the flowers upon visiting them. The exact term used in reference to the mating is *tsota*, a term commonly used in reference to the mating between a cock and a hen.

In the above insect-flower relationships (insect as security, mechanic or mate) the presence of the insects during flowering stages of plants was described as necessary and related as beneficial to the crop plants. However, in another insect-plant relationship, the insect does not please the farmer, as explained below.

Insect as a parasite - Some respondents described the insect (and birds) as parasites, feeding on the flower or something from the flower, which on the whole the flower is adversely affected and fruit and seed production are reduced. While some respondents explained that the insect feeds on the flower parts, other respondents explained that the insect collects *madzi*

[fluid] that they use for making honey, and the removal of the *madzi* has negative effects on the flower and the plant production. Most likely the fluid referred to here is again the nectar. This relation depicts the insect as a parasite, and because yields are reduced, the farmer (with this belief) hates the insect for roaming in the flowers of his crop, and he would already predict poor crop yields.

Some moderate respondents agreed that the insect benefits by extracting some fluid from the flower, but disagreed the arguments that there were negative effects on the plant, because, they argued, the fluid has no use to the flower. According to these respondents, whether the insect visits or does not visit, the flower will still 'grow' into a fruit or seed.

7.5 SEED GERMINATION AND PLANT DEVELOPMENT

The seed is understood as the initial stage of most plant species, and for some species cuttings, suckers, and eye buds were identified as the initial stages. The specific part of a seed that is important for plant propagation is the *chitsa* [embryo] (cf. Chapter 3), which the farmer scrutinizes before sowing, to ensure it is not damaged by pests or disease. In a way the farmer is confirming the viability of the seed. The cotyledons in both mango (dicotyledon) and maize (monocotyledon), are not perceived as important in the seed germination and plant development process, i.e., its scientifically described importance for nourishing the germinating seedling was unknown. The cotyledons in mango and in cashew nut grow above the ground during germination, thus are noticeable and are labelled in Digo, viz. *mwezi* in mango, and *gophodo* in cashew nut. The role of these cotyledons was described as 'only' protective for the *chitsa* in the seed stage. The endosperm in the maize seed, which remains underground during germination, seemed to be even more difficult to assign a role in the germination process.

Subsequent stages in plant development are described differently, depending on the species in question, but all were based on the plant height. The coconut tree, for example, is recognised to have two developmental stages i.e. *mutse* [seedling or sapling] and *mnazi* [the tree], and no other labelled stages except for distinctive descriptions related to fruit producing i.e. *msichana, unavyala*, *mlume*. The term *mutse* generally refers to seedling and sapling, while the mature stage of each species is identified by the respective name of the species. The two stages: *mutse* and 'mature' – noted in the coconut tree are common for most tree species. Probably the maize plant has the most recognised developmental stages, which are described

on the basis of the height of the plant in relation to domesticated birds and animals. These include: *chimo cha kuku* [chicken height] and *chimo cha mbuzi* [goat height]. Other developmental stages are described on bases of the reproduction phase, e.g. *gana-sisa-virere* [stop upward growth – to start reproduction], *gana-tuluza-punga* [producing male inflorescence], *ganatuluza-ndamba* [producing female inflorescence] *gana-vyowa* [have immature cobs], and *ganakata-njiyo* [losing stigma]. The last described stage is indicative that the cob is mature.

7.6 CONCLUSION

The above discussion reiterates earlier observations that the Digo learn through familiarity. From the indulgence in agricultural practices and plant propagating, the Digo have learnt about propagates, and even specific site where the new plant [*mutse*] comes out, i.e. *chitsa*. Even though Digo plant knowledge is characterised by considerable borrowings from the human life situation (including labels of developmental stages), sexual reproduction and male gender are perceived as irrelevant in plant life. However, the interesting part was the observation that the individual Digo attempted to make give some explanations for the plant processes, presenting it as 'what might be' taking place. Clearly though, at a community level there was no obligation for the Digo to understanding the details in plant processes. There were no indicators that the Digo community or specific social group was committed to understand the plant processes, similar to the situation on plant terminology and plant groupings. Explanations given by the individuals were personal interpretations, presented to the best of one's imagination. Otherwise the Digo do not have a commonly shared knowledge on plant processes that could be used to determine the authenticity of a given explanation. Although the discussion focused on plant propagation processes, the comments from respondents on other plant processes e.g. nourishment (photosynthesis) and growth (plant matter), have similar implications.

In summary, the Digo plant knowledge, like any other local knowledge, consists of factual ideas, skills and capabilities, some with empirical background (Antweiler 1998), but it concentrates on readily observable plant features. Thus, although there is a rich lexicon (chapter 3) and some knowledge on groupings among plants (chapter 6), the knowledge above these i.e. the internal plant processes, is not a priority. Thus, even when the explanations given by the individual might not be biologically or conceptually justifiable, the respondents do not feel obliged to give convincing explanations.

CHAPTER EIGHT
DIGO TRADITIONAL FARMING KNOWLEDGE AND PRACTICES

8.1 INTRODUCTION

As a whole the Kenya Coast is characterized by large stretches of semi-arid wilderness in the north and densely populated agricultural land in the south. The Digo occupy most of the medium to high potential arable land in Kwale District where they live on agriculture as the most important economic activity (Spear 1978, Were *et al.* 1987). The old staple food crops of the *Midzichenda* were sorghum and millet, which in the course of the nineteenth century were largely replaced (Spear 1978), and today the dominant crops in terms of area, yield and value at the Kenya Coast are maize, cassava, coconut, cashew, mango, banana, citrus and tomato. Although there are variations between areas and between individual farms in the area, the pool of genetic materials is commonly shared and maintained through a wide area of the Coast region.

This chapter gives an overview of the application of Digo plant knowledge, exemplifying it through assessing specifica practices related to the traditional Digo farming system. Since maize is the staple food cultivated annually and the most widely cultivated crop among the Digo, it has been selected for a case study in the Digo farming system, its knowledge and practices, and its details are presented in an Appendix (cf. Appendix VII). In the text of this chapter, a discussion of general farming practices is made. The information presented here refers mainly to the traditional farming methods, including aspects and practices that are minimally practiced today. The data was collected from about 40 elderly farmers through open-ended discussions about the general annual farming cycle and activities related to specific crops. The discussions were undertaken with individual farmers as well as with groups, where farmers' perceptions and crop management strategies were discussed in common.

8.2 FARMERS' PERCEPTION OF SOIL FERTILITY

Historically the Digo used the shifting cultivation method (Spear 1978, Were *et al.* 1987). In the search the farmer selected a place to cultivate his crop and based his choice on soil 'fertility' - *nguvu ya mtsanga* [strength of soil]] and the specific requirements of the crop to

be cultivated. The Digo farmer usually desires to grow both food crops and commercial plants, and based on soil conditions the farmer may have farmland separated from the residential area. The homesteads, commonly found on sandy soil areas, are also used for growing cash crop (coconut and cashew) and some food crops (peas, cassava, and potatoes). Maize is cultivated on farmland areas that are established on clay soil areas. Digo farmers differentiates soil into three main types:

- *mtsanga mwiru* – black cotton soil, very fertile, with a high clay portion. This soil type is also known as *chilongo* [clay].
- *mtsanga wa kundu* – red soil, moderately fertile, with average clay and sand. This soil type is also known as *mtsanga wa tsuluni* [termite mound soil]
- *mtsanga mwereru* – white sand soil, not fertile, with a very high sand content and low to no clay. This soil type is also known as *tsanga sheshe* [sand gravels].

The above soil types are described by colour and texture, but there is also a strong correlation between these soil categories and the soil's water holding capacity, which compare with basic physical characteristics of soil described in science (Fitzpatrick 1980). However, the Digo see soil fertility as dynamic, since a particular piece of land can become more or less fertile over time as evidenced by a number of indicators, which include the appearance of specific weed species. For example *Chitsai* [*Striga asiatica*] and *Luswi* [*Rottboellia exaltata*] are indicators of low fertility associated with low crop yields, while the presence of the grasses *Bondo* [*Panicum* spp.] and *Mdembe* [*Hyparrhenia sp.*] are indicators of high fertility, associated with high crop yields. *Chitsai* is scientifically recognized as a parasitic weed that leads to low crop yield (Ivens 1982), but the Digo notion on the species is that this plant bewitches the crops, affecting the produce magically. *Luswi* is a vigorously growing pioneer of disturbed ground, hence a troublesome weed in maize and fields of other crops (Ivens 1982). A site dominated by sedges is associated with poor crop yields and hence considered as 'not fertile'. To overcome the sedge menace and poor performance of most crops, cowpeas [*kunde*] are grown on such sites for two to three seasons, which eventually eradicate the sedges allowing for the cultivation of other crops at that site. Nitrogen fixing in the root nodules [*pingu*] of both the sedges and the peas are not understood nor associated to the vigor of these plants. These observations indicate that the perception of Digo farmers on soil fertility is not on its nutrient status, but on the potential of producing good crop yields.

Specific crop plants are known to have specific soil requirements. Rice, banana, sugar cane, and vegetables, are grown in marshy areas [*bura*]. Green peas, cassava and coconut are grown

in sandy soils. Termite mounds [*tsulu*] and black clay soils [*chilongo*] are known for high maize yields.

8.3 SOIL FERTILITY MANAGEMENT PRACTICES

The most common practices used by the Digo to improve the soil productivity are:

- *Fallowing*: Fields are left fallow for up to two years, so that the soil can generate. However, the use of this traditional method to restore soil productivity has been on the decline due to changing land policy. Previously, large land parcels were under clanial ownership (Were *et. al.* 1987) but in the post-independence era, the land tenure system changed, and land is now owned by individual families. Due to land scarcity elsewhere, other ethnic groups have moved into the area and acquired land. This has led to land scarcity in the Digo area, and fallowing has consequently been out of practice.
- *Crop rotation*: Farmers are aware that by rotating crops the yields are improved. The farmers' choice of crops for the rotation is determined by adaptability to soil and rainfall patterns, as well as by the desire to increase chances of food sustainability. Commercial considerations are only secondary. The main crop rotation patterns cited by the respondents are:
    - maize – peas, beans, and ground nuts
    - maize – cassava
    - maize – sesame
- *Crop remains*: After harvesting, maize plants are cut near ground level and the straw is left on the field to decompose and add to the fertility of the soil. Sometimes the crop remains are burnt and the ash acts as fertilizer. Surprisingly, however, the Digo farmer does not associate 'ash' with soil fertility, instead it is understood as a 'pesticide' and observed high crop yields were associated with reduced pest infestation.
- *Manuring*: Some crop farmers keep livestock, and the dung is used to maintain and enhance soil fertility. The manure is gathered and allowed to decompose before it is applied on the fields. However, there are relatively few farmers who keep livestock, and even the livestock holders own only a small number of cattle per household. Thus the application of manure is low and restricted to small areas around the homesteads, mostly to the home gardens.
- *Terracing*: On slopes, farmers construct terraces to improve soil fertility and crop productivity. But this practice is used with only certain crop types, particularly tuber plants, such as cassava, potato and yams.

- *Weeding*: Farmers also enrich their soils by uprooting the weeds, which they drop on the ground to decompose, or burn them to ashes or bury them as green manure. Whichever way chosen, it adds to the fertility of the soil.
- *Mineral fertilizer*: The use of mineral fertilizer is very limited and is an indicator of high socio-economic status. The traditional farmers argued that due to the low and unpredictable rains, and high pest infestation and diseases, it is a great risk and mostly unprofitable to use costly mineral fertilizers.

8.4 PLANT PATHOLOGY AND PEST MANAGEMENT

Pest infestation and disease are some of the main problems facing the Digo farmer. Sometimes the farmer is unable to successfully address the 'pest' or 'disease' itself, and rather adopts an increased 'sowing' to increase the chances of obtaining an unaffected crop. However, this does not mean he does not attempt to deal with the pests or diseases, rather it can be understood as adopting less effective methods. Ash, whose fertility effects are not known, is used by the Digo farmer as a pesticide against *kunyale* [caterpillars of moths], also known as *fumbiri*. An extract from the leaves of *Mtsunga wa utsungu* [*Launaea cornuta*] is sprayed on infected plants by caterpillars or sprayed directly on the pests, in order to kill them. Some farmers deal with the caterpillar infestation by smoking infected leaves at a fire place, and this is believed to chase the pests in the crops on the farm (by proxy or magically). Weaver birds and wild pigs are major pest problem to the Digo farmer, as these pests feed on the maize seeds just after sowing and even as mature cobs. To avert the wild pig problem some farmers collect soil from a foot print of the pig at the place where the pig entered the farm, put it in a shell together with rain water, and then bury these in a thick forest. This exercise is believed to magically affect the pigs and make them unable to find their way to the farm any more. Generally, the Digo do not use synthetic pesticides, but rather share their crop with the pest. Thus, to reduce loss through pests such as rats and weaver birds, the Digo farmer sows more seeds in each hole, so that even after the pests feed on them, there would be enough left for the farmer. In maize growing, four to six seeds are put in each planting hole, instead of the officially recommended one or two seeds.

While working in the crops, Digo farmers must exercise respect in their social conducts, especially in sexual relations. Disregarding this rule has a direct impact on the crop, which will appear as a disease on the plants, and this can only be solved by a healer. This belief is in

addition to other magical influences e.g. *kutsorera* and *dzongo* that are said to affect the yields of the crop. *Kutsorera* is a magical influence believed to transfer the quality of a crop from one farm to another, thus a victim ends up with a poor harvest even though his crop looked good. *Dzongo* is an act of jealousy or hatred where one spoils the crop of neighbours with an 'evil eye'. For both influences one can call a healer to put a protective charm [*fingo*], so that attempts to 'steal' or 'destroy' the crop will fail. *Dzongo* is a less sophisticated magic rite that can be healed by the farmer himself by putting pepper or fruits of *Catunaregam nilotica* [*Mdzongodzongo*] on the farm to counteract the evil eye. Pepper when placed in the farm makes the witch to have itching eyes, and *Catunaregam* fruits help to abort bewitching. These magical influences are different from physical stealing [*kuiya*], against which the farmer physically guards the fields or calls a healer to put a protective charm [*chirapho*].

8.5 MAINTENANCE OF TRADITIONAL CROP CULTIVARS

Most crop plant species have a wide range of varieties, and the farmers show a great interest in conserving the seed of the varieties left to them by their parents. Frequent famines that struck the area force many farmers to eat up all their seeds, and they later have to look for new seeds (Waaijenberg 2000), which results in a slow variation of traditional varieties. With regard to maize farming, Digo farmers prefer to grow the 'local' cultivars, a diverse mix of materials introduced by the Portuguese and English (Harrison 1970; Waaijenberg 2000) in the 17^{th} -18^{th} centuries during trade and administrative contacts (Spear 1978). These cultivars have naturalized so much that the Digo consider them as their own, hence they refer to these cultivars as '*matsere ga chidigo*' [Digo maize cultivars]. The Digo farmers have for centuries learnt how to cope with these cultivars, and are reluctant to let them go for modern cultivars. The modern hybrid maize cultivars suitable for the coastal belt (Pwani hybrid, Coast composite, and Katumani), are locally known as '*matsere ga chizungu*' [European maize cultivars] and are less preferred, mainly because their seeds are expensive. Unreliability of the rains and high weed and pest incidence at the Coast are other reasons to withstand growing the hybrid maize varieties (Waaijenberg 2000). In addition, such modern varieties need mineral fertilization and the use of pesticides, which adds considerably to the farming costs.

The Digo farmer prefers to grow as many cultivars of the same crop species as possible, due to the varied advantages associated with individual cultivars. For example, the maize cultivar *Chifumba tele* is grown on a forest edge because it is of short height and allows for the

detection of baboons and monkeys that invade farms to damage the crops. However, some farmers prefer some cultivars because they are 'lucky' with them, and avoid others with which they feel uncomfortable with [*sinago mkono*], i.e., they get low crop yields.

8.6 CONCLUSION

A great part of the Digo farming system and knowledge seems to have been achieved from their capacity to observe and develop an experience of correlation between different components such as crop plants, soils, pests and disease. Thus a Digo farmer recognizes and classifies soils, for a particular purpose – crop production, which is his priority investment. Today some old farming practices are maintained, while others have been dropped due to various socio-political reasons. Some traditional practices related to soil fertility management have been affected by political changes in the land tenure system. Probably the change from customary land tenure to 'individual' land ownership was the point of departure for the shift from a Digo 'communal agricultural practice' in terms of control and management, to 'free style' individual farming practices and management. The break of communal farming and management, combined with high pest infestation and unreliable rains, have contributed considerably to poor crop yields among the Digo. The frustrations associated with low crop yields have led to the maintenance of magical practices in farming. On the other hand crop failure due to one reason or another has contributed to the farmers' efforts in maintaining the cheaply available traditional cultivars against the expensive modern cultivars. For details on the resistance of Digo farmer towards modern cultivars, the reader is recommended to chapter 9.

CHAPTER NINE
THE FUTURE OF THE CONTEMPORARY DIGO PLANT KNOWLEDGE

9.1 INTRODUCTION

The Digo have had historical encounters with other African, Arabian, Asian and European traders, rulers and missionaries. However, the most recent, ongoing and most influential global encounter for the Digo plant knowledge is scientific botany, which enters the Digo community directly through schools or indirectly through the work of agricultural advisors and occasional training courses for local healers and farmers. This Chapter[7] focuses on the influence of scientific botany on the Digo plant knowledge and related practices, and eventually comments upon the future prospects of the Digo plant knowledge, i.e. its vitality. In general it can be said that the relationship between the Digo plant knowledge and scientific botany ranges from one of co-existence over interaction up to a complete blending. The latter may vary between the extremes of total takeover and thorough cultural mixture. The different relations are exemplified with constellations in three specific Digo plant knowledge areas, namely: language use, phytotherapy activities and agriculture practices. In previous Chapters it was noted that the Digo plant knowledge is partly verbal, when plants and plant related processes and phenomena are described and commented upon, and partly it is non-verbal, i.e. observable only as action e.g. in agriculture and phytotherapy.

In order to structure the plant knowledge and to distinguish its local from the global aspects there is need for some terminological reticence. Specifically relevant here is the plant knowledge of the Digo farmers and healers. As it turned out, this knowledge was relatively uninfluenced by botanical science (e.g. from farmers who have not been to school and who have missed or avoided agricultural training). Historical evidence shows that the knowledge of farmers has been in practice for more than four previous generations. This ‘old’ Digo plant knowledge, which was elicited from the elderly Digo, was compared with the plant knowledge held by the young Digo (pupils, students and post school youths), who are being or have been exposed to scientific botany. The following is a synthesis of the responses from and observations of the elderly illiterate Digo (farmers and healers) and the young educated

[7] The content of this Chapter were presented in the 2nd Symposium of the SFB/FK 560 in October 2004 in Bayreuth Germany

Digo. The discussion concentrates on the three major types of encounters between the Digo plant knowledge and modern plant science, depicting the reactions in the following:

1. **Language**: a) the complementary use of non-borrowed and borrowed plant description terms
   b) re-structuring of the semantic field of colour terms
2. **Phytotherapy**: inherited cultural loans and modern global support of the local healers
3. **Farming**: resilience to the modernization of the agricultural practice

9.2 COMPLEMENTARY SOURCES FOR PLANT LEXICON

The Digo show a wealth of linguistic expressions and undeniable experience in plant handling. There are about 500 recorded Digo plant names (Pakia 2000, Appendix III), ten distinct names of vegetation types and over 70 labels for different plant parts (cf. Chapter 3). However, school knowledge has introduced into the Digo vocabulary, particularly among the young Digo speakers, terms that were never there before. Plant observation as revealed by the non-borrowed lexicon is restricted to parts and processes that are visible to the unaided eye. The presence of microscopes, other scientific facilities and literature in the school led to the understanding of the presence of sub-structures (e.g. cells, vascular tissue, stomata etc) in plants. Due to lack of equivalent terms in their vernacular, the teacher and the students are obliged to use the 'new' English or scientific terms even as they converse in Digo. For example, during the interviews of this study, a typical answer from young educated Digo to the question 'how do plants take up water?' was the following "… *paipu mbiri kpwenye huno muhi. Kuna phloem, na xylem sasa hino xylem ambayo inahala* …." [….. there are two pipes in this tree. There is phloem and xylem, now this xylem which takes ….]. However, in addition to microscopic parts, other relatively larger parts that are not lexicalised in Digo, e.g. petals, sepals, anthers and bracts, are referred to in Digo by their botanical terms. These scientific labels are used to fill a gap, where otherwise there was no label; ultimately in the language there is a composition of terms which do not blend or replace each other but complement and enrich the vocabulary.

Born on fluency and richness of the answers in a topic, responses from post-school young Digo led to the suspicion that the 'new' terms (scientific or English) learnt in school are not maintained for long, but to a large extent are lost together with most of the other school-learned knowledge. Unlike the pupils, the post-school youths were ill-at-ease with questions

demanding scientific knowledge e.g. 'How do plants transport water?' They were neither confident nor fluent in explaining the scientific terms which they at best vaguely remembered. Descriptions of processes such as 'photosynthesis', 'transpiration' and 'pollination' were poorly or wrongly presented, and functions of parts such as 'stomata', 'ovary', and 'pollen grains' were mixed up. It was difficult to state what they truly knew, and sometimes they seemed to remember only the terms. In contrast, when these people were asked about spirits and demons, their confidence and fluency revitalised. For example, most of them knew the trees said to be the residence of spirits. These youths also showed relatively more knowledge in what they had learned from home, e.g., the Digo lexicon for plant parts, medicinal plants, traditional farming practices and local crop cultivars. The indications here are that there might be an intermediate state of knowledge and semantic gain from science, much of which though is lost with time after school.

In contrast to the school scientific terms, borrowed terminologies which form part of the daily life of the Digo, e.g. names of introduced plants e.g. *Kabichi* [Cabbage], *Mtiki* [Teak], *Mkasuarina* [Casuarina], *Bikisa* [Bixa], and *Karoti* [Carrot], are likely to stay and be stabilised in the Digo language.

The deduction here is that the school offered an environment that encouraged the use of scientific and English terms in Digo conversation, but the pupils remembered them only when they were in school. This was because the school knowledge does not fit into the practical life of the Digo, thus at home pupils and students find their school knowledge being out of place with most of it not applicable. At the same time, participating more fully in the domestic activities, e.g., farming, they learn more Digo plant knowledge and practices. Thus, while the school knowledge is forgotten, Digo plant knowledge is learnt, which indicates a prospective stability for the Digo plant knowledge.

9.3 SHIFTS AND RE-ADJUSTMENTS IN COLOUR TERMINOLOGY

The Digo are characterized with considerable openness in verbal behaviour, especially in the lexicon. In the Digo language there can be areas identified with an ongoing expansion of terminology and consequently a restructuring of semantic fields – incipient but visible. The process is exemplified here with reference to colour terminology, especially as applied to plants. The external partner in this example is not only scientific botany, but also the usage of colour terms in the English language. The most striking conflict with resulting mixtures is revealed by a comparison of English 'green' with lexical descriptions of plant colours in

Digo. In English, ‘green’ has considerable polysemy, i.e., a very broad range of applications. Leaving aside the references which are not directed to vegetation, most important in this context is the ‘green’ that serves as the unifying colour term for the plant kingdom. Almost any type of vegetation is inseparable from the notion of ‘green’. What is more, ‘green’ includes the material side of vegetation, i.e. it refers to the plant matter, cf. ‘green grocer’, ‘green house’, ‘greenery’ etc.

In looking for equivalents in Digo, reference is made to the language used by ‘older’ speakers lacking formal education. It turned out that the Digo language does not have a comparable cover term as ‘green’. The speakers distinguish a range of colour terms for plant description in which three terms are prominent, but with connotations which differ considerably from the structuring of the colour field in English. The colour of stages of a ripening mango may be described in English as: (1) dark green, (2) reddish and (3) yellow. A Digo farmer describes the same stages as (1) *dziru*, (2) *kundukundu*, and (3) *dzereru*. On a colour chart ‘*dziru*’ has its focus in black, and the term is applied to many objects which in English would also be termed as ‘black’. Equivalent relationships exist between ‘*kundu*’ and ‘red’, as well as between ‘*dzereru*’ and ‘white’ (cf. Chapter 3). It has to be stressed that apart from the three terms indicated above, Digo has a wide range of derived or borrowed colour terms, including terms corresponding more closely to ‘green’ , such as the transfers ‘*itsi*’ [unripe], ‘*nyasi*’ [grass] or ‘*chirere cha mgomba*’ [banana shoot], or straightforward borrowings such as ‘*griin*i’ (from English) or ‘*chijani*’ (from Kiswahili). However, the vegetative connotations of ‘*dziru*’, ‘*kundu*’ and ‘*dzereru*’ are among the prominent markers of ‘old’ vs. ‘new’ Digo and a point of contention between the generations. Young Digo (including the author), who have learned the English terms for the entire colour spectrum at school or even pre-school, together with the notion of nature being ‘green’, either ignore the colour references used by their parents, or are strictly opposed to them, in spite of their reverence for age. If they take up the most rigorous standpoint they maintain that ‘plants are green’ without admitting any modification. Speaking in Digo, they use the borrowed terms ‘*griini*’ or ‘*chijani*’.

The above described situation can be better understood by introducing the notion of ‘basic color terms’ as presented first by Berlin and Kay (1969). According to these authors, underived and unborrowed (i.e. basic) colour terms evolve in a sequence which is independent of a given culture. Within their evolutionary scale, stage I has two categories, viz. ‘white’ and ‘black’; at stage II ‘red’ is added (Fig. 9.1). ‘Green’ appears either before or after ‘yellow’ at

stage IIIa or IIIb. Berlin and Kay list Swahili as a Stage II language, and neighbouring Digo shows the same characteristics, as they have white, black and red as the basic colours.

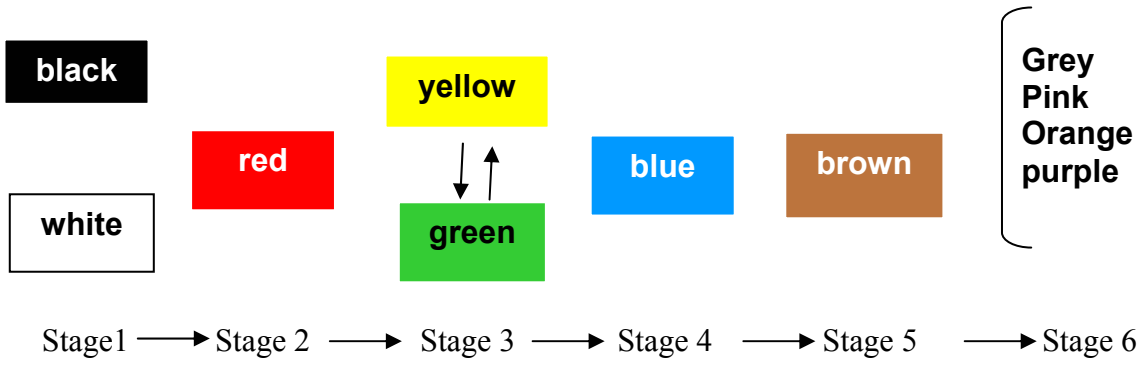


Fig. 9.1: Illustration of the evolutionary sequence of underived colour terms in languages (Adopted from Berlin & Kay 1969).

As indicated above, although there are many other colour terms available in Digo, the prominence of the 'basic' colour terms is still observable by a number of traits; for example:

- the three terms are true adjectives having adjectival concords (cf. Appendix IV), e.g. *chitabu chakundu* [red book], *chitabu chiru* [black book] and *chitabu chereru* [white book].
- they are the only ones used in the description of demons or other members of the spiritual world, e.g. 'red' is *bara-masai*, 'white' is *mwarabu* or *mdzomba*, and 'black' is *mdigo* or *chitsimba kazi*.
- they are preferred in emphatic expressions, i.e., *nyereru tseeeee* [bright white], *nyiru piiiiii* [dark black], and *kundu dooooo* [deep red].
- returning to the point of departure, they are preferred in plant descriptions as given by older speakers.

The resulting cultural mixture – still in progress – can be characterized by the following (old and new) features. In their use, the young Digo restrict the application of the 'basic' colour terms, and the semantic field of colour terms is consequently restructured. It is very likely that the 'basic' colour terms will continue to attenuate in general application and in plant descriptions. However, some fixed terms related to agriculture will probably remain, e.g., a phrase '*matsere ganafunga wiru*' [the maize is becoming 'black', i.e. dark green], where the basic colour *nyiru* [black] here refers to the 'maturity' of the maize. In such expression the colour notion of '*nyiru*' will be weakened in favour of the notion of 'maturity' or ripeness. In the next two to three generations it might be difficult to understand why a colour term is used

in reference to crop maturity, as the basic colour '*nyiru*' would be no longer featuring in plant description i.e. in reference to 'green'.

9.4 GLOBAL SUPPORT AND ENRICHMENT OF PHYTOTHERAPY

As elsewhere in Kenya, phytotherapy is a very important part of Digo plant knowledge. Phytotherapy does not seem to suffer from a global conflict, but rather enjoys support and recognition from the Kenyan government and even from outside Kenya. This support stems from the growing appreciation of alternative medicine in many parts of the world. The support leaves phytotherapy as such untouched, i.e., it does not interfere with the therapeutical core, but is geared at improving the standards of collecting, preparing and administering these substances. The 'Kenya Neem Foundation' a non-governmental organisation, puts the aim as 'production of alternative medicines in a more hygienic and safer environment' (Cited in a Kenyan Local News paper – The Daily Nation July 27-2004).

All the visited healers had Government licenses of operation and certificates of attendance of Government and NGO sponsored courses and seminars. This led to a strong liaison with modern medicinal institutions, and the use of modern tools such as gloves and scapel, e.g. by the birth attendants. The degree of 'modernity' varies from one healer to another, mainly depending on the economic status of the person. Mr. Abdalla Mnyendze is probably a case of the 21st Century healer, who owns an office where he treats his patients. Traditionally the patients' attendance is done under a big tree or in a rock cave by the sea shore. Also in the office, where a label 'Dr. Mnyendze' decorates the wall, are labelled bottles containing different concoctions from medicinal plants which have been prepared in advance. Under normal circumstances, the healer would visit the forest after a patient has explained his or her problems; not to mention that in Digo healing writing has not been part of the art. In spite of his assumed Doctorate and modernity, Mnyendze bases his authority very much on his famous teachers who did not have the chance to participate in government medical trainings. Before preparing the medicines, he tells the plant about his therapeutical ancestry as a basis to command authority. In other words he influences the medical substance through an incantation. This can be seen as step backward from the 'new' phytotherapy, and in a strict sense, therefore, there is a mixture of rational phytotherapy with something magical.

There is also evidence for the integration of Indian, Swahili and Arab medicines and cures (Schulz-Burgdorf 1994), which can be traced back several centuries. In healing, it is common

to find Digo plant medicines combined with a special term used by healers, '*mihi ya pepho*' [cold plants], refers to *Grewia plagiophylla, Lannea schweinfurthii, Ormocarpum sennoides, Sclerocarya birrea* and *Adansonia digitata*. These plants are used to 'cool down' a problem, and thus create harmony. 'Cold' and 'hot' together with 'wet' and 'dry' are the key notions of humoral medicine which was prominent in Medieval Europe, and is still influential in some Arab Schools of medicine. It is possible that the notion of cold, maintained by the Digo is a remnant of Arab medical influence.

On the whole therefore, trends of modernity and blending in Digo healing can not be denied, but basically the therapeutical substances still consist of the traditional plant components. Thus, while the healers portray an external modern appearance, their core functioning in the treatment is based on the Digo traditional healing system which, according to the observations of this study, will remain in existence for a considerable time to come.

9.5 RESILIENCE IN AGRICULTURAL PRACTICES

The general Digo farming practices have been discussed in Chapter 8 of this thesis, and the cultivation of maize, which is the staple food of the Digo presented in Appendix VII. As mentioned in the previous Chapter, about ten traditional varieties of maize are cultivated, and there are also 'new' varieties (hybrid maize) associated with considerable better crop yields. Agricultural consultants visit the Digo farmers and encourage them to grow the hybrid maize varieties, and pupils in school are taught about modern farming systems. Furthermore, the media (TV, Radio, magazines and news papers) present news and information on plant science and plant farming systems which also reach the Digo farmer in one way or another. However, on visiting farms it was noted that the Digo farmers have not changed their 'old' farming style. The farmers categorically refuse to use the hybrid maize seed, because (they said) it is expensive and has to be bought every year, while they could get the local varieties from their last harvest, or from neighbours and friends for free. The farmers also continued to plant 4 – 6 maize kernels in a hole, not the officially recommended 1 – 2 kernels. This is done 'to cater for the rat's share', they explained. The farmers argued that when planting only 1 kernel in a hole, and the rats visit the fields nothing would be left for the farmer. Due to inability to purchase pesticides such as rodenticides against the rats, the Digo farmer addresses the pest menace by increasing the number of maize plants per hole or hectare (cf. Chapter 8).

Although it was expected that the 'old' Digo farming practices would be slowly replaced by the 'modern' techniques, especially because the increasing population requires higher crop yields, the observations in the farms disapproved that expectation. Resilience of the local farming practices to the global knowledge and influences could be traced to the following factors:

- Knowledge offered in schools is too academically oriented with little practical reference to the local situations, i.e. it does not build on the existing knowledge. This is notable mainly by the fact that the medium used in school is English and contains scientific (Latin) terms, most of which are neither translatable into the local lexicon nor applicable in the local scene.
- Teaching is done without the necessary facilities to enhance learning. With too theoretical lessons, concepts are turned into simple fantasies and students are left to imagine facts. For example, during visits to school classes and interviewing the pupils, it was noted that in a lesson on 'Bio-gas processing', there was not even a drawing of the processor. In a lesson on 'the use of a tractor', there was not even a picture of a tractor, and these were common situations for other lessons.
- In Digo tradition there is a strong respect of local elders' authority (including practices and knowledge); thus, a knowledge learnt in school cannot be implemented at home if it is disapproved by the elders. This natural age boundary and unquestionable respect does not allow for competition or conflict between the school-learned farming practices and traditional Digo farming practices, with the latter continuing to be practiced unchanged.
- There is very little aid to the local farmer, who usually can not survive loss, e.g. from using modern practices. The hybrid maize, fertiliser and pesticides all require financial input, which considerably adds up to the farming costs. If these commitments are taken and the rains fail (which is a common occurrence) and since there is no irrigation system, the loss the farmers incur is too much for them. This leads to the farmers' preference of the traditional ways and cultivars which are based on centuries of experience. It is with reference to this point that Waaijnberg (2000) is of the opinion that what the Digo farmers do at present is the best they can do.

All in all, it is agreeable that the traditional farming method is still the Digo farmer's best means of survival, in a time when he is not thriving to become rich, but to survive and keep away from hunger. With continued lack of external support, the Digo farming knowledge and practices are likely to continue in the foreseeable future.

9.6 CONCLUSION

The survey made shows that school-mediated plant knowledge is rapidly forgotten, and after two to five years scientific concepts and terms are only vaguely or not at all remembered. Thus the vocabulary of scientific botany will not have much chance of survival in the everyday Digo, although it could have become functional and fill in the terminological gaps, if it fitted into the practical outlook of the Digo. The fact that post-school people show relatively improved traditional plant knowledge as they become almost full time helpers in domestic farming, gives Digo plant knowledge a potential to survive. On the restructuring of colour terms, it is clear that the central role of Digo basic colour terms is on the way to weaken, while simultaneously the application of the 'new' colour terms is stabilising. However, the language is creating niches for the survival of the exclusive application of these 'basic' terms, especially in emotional expressions and fixed phrases. The changes in colour terms are irreversible, and have a very high degree of vitality, particularly because they are not based on a conscious commitment by any group of speakers.

The Digo healing, with remnants of Arabic-Swahili medical influence, is not hybridised in content but modernised in form (hygiene, standardised dosage etc) to become more marketable and competitive. This is a conscious effort which is generally accepted, and in line with the agency of the actors (healers) who are geared towards a 'better and appreciated' system, and improved social status. However, there is still a clear combination of somatic phytotherapy and magic or ritual. The observations in this study show that traditional Digo healing (in content), will remain for a long time to come.

In agricultural practices, the Digo farmer, whose agency is framed by needs to survive and who has a long history of low yields and eminent hunger, cannot afford to enhance risks in their already marginal economy. Thus there is a conscious resilience towards global influence, and the farmers' apparent conservatism has no ideological value for them but is a strategy for survival. And due to the lack of material aid to the Digo farming, it is evident that the Digo traditional farming practices will continue into the foreseeable future.

On the whole, therefore, Digo plant knowledge might suffer the loss of some lexical expressions, particularly traditional colour descriptions for plants in the near future, but general knowledge and practices in farming and traditional healing will remain in place. In contrast to the generalised belief that the modern or global (science) inevitably replaces or

blends with the ‘local’, the Digo are active ‘actors’ selecting what to change and what not to, based on the material risk and expected social benefits resulting.

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APPENDIX I: Questionnaire used for data collection of the traditional Digo Plant knowledge (English version)

Name

Age

Academic level

Who is the source of your Digo plant knowledge?

1. For living things it is necessary to eat and drink. Do plants also need to eat and drink? If yes, what do they eat and drink, and how do they eat and drink?

2. Are wind, air and sunlight important in plant life?

3. What is the function of roots in plants?

4. What is the importance of leaves in plants?

5. When a plant is cut or injured, does it feel pain?

6. Are plants likely to be residence of spirits? Give example of such plants. Is it necessary to follow certain customary rules before collecting parts of such plants?

7. In Swahili people say '*kila shetani ana mbuyu wake*'. Are there such sayings in Digo that relate to plants or forest that you know?

8. Why do plants such as the baobab lose its leaves during the dry season?

9. What foods, medicines and other useful resources are found in the forests?

10. How do you identify different plant types?
    - by viewing the plant form or shape?
    - by viewing the shape of leaves?
    - by the type of fruits?
    - by 'touch' features?
    - by smell?
    - by taste of parts?
    - by colour of plant parts?

11. What types of plants do you know?

12. Mushrooms are what type of plants?

13. Are there male and female plants?

14 In human life there are different stages of development, from a baby, young adult and to elderly person. Are such stages found in plant life?

15 In plant life what is the propagation material, and how does it develop to a full plant?

16. How do plants procreate?

17. Butterflies, bees and birds like visiting flowers of some plants. What is the relationship between these organisms and the plants? Are there any benefits or loss to either party?

18. Do you grow plants for ornamentation? And do wild plants have ornamental features?

19. What is the important of weeding?

20. What destroys crop plants?

21. Some farmers inter-crop plants, what crops do you inter-crop, and why?

22. Some farmers use cattle dung to improve crop produce, which ways do you use to improve the produce of your crop, and why?

23. What facilities do you use for farming?

24. Are magic and witchcraft important in crop farming?

25. Is religion (Islam, Christianity or Traditional) important in crop farming?]

APPENDIX I: Questionnaire used for data collection of the traditional Digo Plant knowledge (Swahili version)

Jina
Umri
Kiwango cha elimu
Mpaji ujuzi wako katika mambo ya miti ya kienyeji

1. Kwa maumbile lazima kuna kula na kunywa.. Je, miti pia ni maumbile na inakula na kunywa? Kama 'ndio' ni nini vyakula na vinywaji vya miti, na inakula na kunywa vipi?

2. Je, upepo, hewa na nuru ya jua ni muhimu katika maisha ya miti?

3. Je, kazi za mizizi ya miti ni nini?

4. Je, umuhimu wa majani katika miti ni nini?

5. Je, mti unapokatwa au kujeruhiwa huhisi maumivu?

6. Je, inawezekana miti ni makao ya shetani? Ni kama miti gani? Ni lazima kufuata sheria maalum wakati unachkua sehemu ya mti ambao ni makao ya shetani au pepo?

7. Katika misemo ya kiswahili watu husema 'Kila shetani ana mbuyu wake'. Kuna misemo ya Kidigo kama huu inayohusu miti au msitu unayo ijua? [In Swahili people say '*kila shetani ana mbuyu wake*'.

8. Kwa nini miti kama mbuyu na miengine majani yake hukauka na kuanguka, wakati wa ukame?

9. Ni aina gani ya chakula, dawa au faida zengine, hupatikana msitunii?

10. Ni namna gani unatambua aina ya mti tofauti tofauti?
    Kutazama umbo la mti?
    Kutazama umbo la majani?
    Kutazama aina ya matunda?
    Kuhisi kwa vidole sehemu fulani za mti?
    Kutumia harufu?
    Kuonja ladha ya sehemu za mti?
    Kutazama rangi ya sehemu za mti?

11. Unajua miti aina gani na gani?

12. Uyoga ni miti aina gani?

13. Je, kuna miti ya kiume na kike?

14. Katika maisha ya binadamu ziko hali mbalimbali kama kuwa mtoto mchanga, msichana au mvulana, barobaro, mtumzima na baadaye mzee. Je, hali kama hizo pia ziko katika maisha ya miti?

15. Katika maisha ya miti mbegu ni sehemu gani, ha hukua namna gani?

16. Je miti inazaliwa namna gain?

17. Vipepeo, nyuki na ndege hupenda kuenda kwenye maua ya miti fulani. Na kuna uhusiano gani baina ya wanyama hawa na miti hii? Je, kuna faida au hasara yoyote kwa miti na/au wanyama hawa?

18. Je, munakuza miti ya kurembesha bustani zenu nyumbani? Na miti ya porini iko na uzuri pia?

19. Umuimu wa kupalilia ni nini?

20. Ni nini huharibu mimea?

21. Baadhi ya wakulima wanakuza miti pamoja, Je ni miti gani wewe unakuza pamoja na kwa nini?

22. Wakulima wengine hutumia kutia choo cha ng'ombe ardhini ili kuboresha mazao ya mimea? Wewe unatumia njia nyingine, na kwa nini?

23. Ni vyombo gani ambavyo unatumia katika ukulima?

24. Je, uganga na uchawi ina umuhimu katika ukuzaji wa miti?

25. Je, dini (kiislamu, kikristo au ya kimila) ni muhimu katika ukuzaji wa mimea?

APPENDIX II: List of respondents involved in interviews and discussions, presented in order of social groups (NB: some respondents cut across the social groups e.g. farmer-healer)

KAYA ELDERS

Abdallah Mnyedze	Kaya Kinondo
Mohamed Mwamatezo	Kaya Likunda
Hussein Siwa	Kaya Diani
Abdalla Boga	Kaya Diani
Ramadhan Mwapataka	Kaya Diani
Suleiman Dawa	Kaya Diani
Juma Juma Ganzori	Kaya Tiwi
Hamisi Kala	Kaya Likunda
Rashid Mambo	Kaya Muhaka
Mwakuloha Abdalah	Muhaka

FARMERS

Juma Mohamed Mwahari	Vuga
Hamisi Ali Mwakurichwa	Muhaka
Mwanajuma Matano	Muhaka
Shee A. Mwadzinare	Muhaka
Bakari Zondo	Vuga
Mwakande Hundeiyi	Vuga
Suleiman Mambeya	Vuga
Fatuma Chiphanga	Diani
Suleiman Siwa	Diani
Ngozi Abdalla Simba	Diani
Hamisi Omari Dzivwa	Unkunda
Ramadhani Mwakalato	Ukunda
Bakari Mwakuzimu	Ukunda
Mambo S. Mambo	Muhaka
Tarifaa Mwalaulo	Vyongwani
Omar Kanga	Tiwi
Ali Mohamed Zimbu	Tiwi
Omar Mwakusema	Tiwi
Mzee Alii	Tiwi
Rashid Mwanyoha	Tiwi
Bakari Chakwe	Kinondo
Ali A. Chitega	Kinondo
Bakari Mwatete	Kinondo
Mwalimu Hemed Mwafujo	Mwabungo
Ndaro Mwafulusi	Lunguma
Suleiman Mbiti	Lunguma

Kayuga Fujo	Lunguma
Salim Katunga	Lunguma
Juma Tsetsetse	Lunguma
Idd Mwaboma	Vyongwani
Mwembe-Zembe farmers group (10 farmers)	

HEALERS

Salim N. Mwakweli	Kinondo
Mebakari Bakari Chakwe	Makongeni
Salim A. Chiwaka	Kinondo
Bakari A. Mnyendze	Kinondo
Mwanaidi Adidi	Kinondo
Mwatime Mwnyi	Kinondo
Mariam Salim	Kinondo
Hamisi Majaliwa	Vuga
Nkoti Juma Ngefa	Vuga
Said Ali Godi	Tsimba
Hamisi Mwangaza	Muhaka
Mzee Krauni	Kombani
Swaleh Dzilala	Waa

POLE CUTTERS/HOUSE BUILDERS

Halfan Hamisi Chimbombo	Vuga
Abdalla Mwasene	Vuga
Juma Mahone	Chirimani
Juma Zandzale	Muhaka
Kassim Chidege	Ukunda
Rajab Mwaboma	Lunguma
Hamisi A. Doni	Tsimba

CARPENTERS

Said A. Zingi	Diani
Swaleh Suleiman	Vuga
Salim Zehulo	Vuga
Peter Kassim	Tsimba
Muda Abdallah	Tsimba
Mohamed Gakurya	Matuga
Juma Juma Shauri	Ukunda
Mohamed Sarai	Muhaka

VEGETABLE – MUSHROOM COLLECTORS

Mejumaa Ndaro	Lunguma
Mwanatumu Nadzuwa	Lunguma
Marera Dzombo	Lunguma
Binti Chishaka	Lunguma
Mwanasiti Garero	Vyongwani
Asha Suleiman Goyo	Diani
Mwanarusi Jabali	Diani
Samini Ali	Ukunda
Mwanasha Ganzori	Tiwi
Bidala Mohamed	Tiwi
Hadija M. Dzendze	Msambweni
Mwanasha Sirikwa	Msambweni
Bintihamadi Dzarino	Msambweni
Mamboleo Bakari	Kinondo
Mwanajuma Juma	Kinondo
Halima Rashid Pesa	Kinondo
Fatuma M. Mwasumbi	Kinondo
Asha Juma Zamu	Kinondo
Tabu Omari	Kinondo

AGRICULTURAL EXT. OFFICER

Fredrick Mwawasi	Kwale

SECONDARY SCHOOL STUDENTS

DIANI SECONDARY SCHOOL

Hassan Mbwana	Form 4
Shibe M. Shibe	Form 4
Zani Hamisi	Form 4
Mwahasi Mwachega	Form 4
Mgandi Mwadzaya	Form 4
Munyiva Kasonga	Form 4
Peter Mwero	Form 4
Subira Chanjari	Form 4
Pili Omar	Form 3
Nema K. Rawende	Form 3
Ramadhani Juma	Form 3
Juma Bakari	Form 3
Mohamed Lagiza	Form 3
Zenatra Gula	Form 3
Rehema Sinago	Form 3
Aisha Mwakutala	Form 3

Omar Mzee Chasi	Form 2
Koka Boga	Form 2
Mebakari Mwabishi	Form 2
Makoroma Juma	Form 2

KINONDO SECONDARY SCHOOL

Ali Idd	Form 4
Mwanasha Boga	Form 4
Sofia Mohamed	Form 4
Hassan A. Mtukuu	Form 4
Mariam Mwaboga	Form 4
Mwanalima Mwinyi	Form 4
Halfan O. Chirema	Form 3
Rehema H. Kama	Form 3
Salim Magogo	Form 3
Idd R. Mdzala	Form 3
Mariam Hussein	Form 3
Rehema Hussein	Form 3
Juma Athumani	Form 3
Hamisi Mwarizo	Form 2
Zania Mwalaba	Form 2
Sita Omar Lalo	Form 2
Abduli Mbingi	Form 2
Rehema O. Mwabeha	Form 2
Shee Randzuga	Form 2
Ali Mwanyendesi	Form 2

KAYA TIWI SECONDARY SCHOOL

Nassoro S. Mwanganyawa	Form 4
Salim Magogo	Form 4
Bintiathumani Guli	Form 4
Twalib Makarani	Form 4
Fredrick Ngala	Form 4
Mwanamkasi Idd	Form 4
Mebakari Hamisi	Form 4
Sudi Masemo	Form 3
Lipo Suleiman	Form 3
Tatu Abdallah	Form 2
Juma Mwarizo	Form 2

PUPILS (Tiwi Primary School)

Mwachirimira Hamisi

Mishi Omar Mwamairi

Abdallah Mohamed Mwasuche

Zainabu Mwasaria

Mwanakibu

Mohamed Chigudi

Hamisi Mwadzereru

Mwanasiti

Mwanahalima

POST SCHOOL YOUTHS

Kassim Nassoro Tunu	Vuga
Mohamed Ali Zingi	Vuga
Omar Said Msirikeni	Vuga
Abdalla Idd	Vuga
Mohamed Idd Nariri	Vuga
Kudura Nariri	Vuga
Nassoro Mwanganyawa	Vuga
Abdallah R. Mwakoi	Vuga
Hussein R. Mwakoi	Vuga
Hassan M. Mwauchi	Tiwi
Said Mwajefwa	Tiwi
Bakari Shauri	Tiwi
Juma Mwakoyowa	Tiwi
Omari Chivumba	Tiwi
Nassir Mwabuga	Tiwi
Ali S. Zimbu	Tiwi
Kadara M. Kashembwe	Tiwi
Omar R. Mwagandzori	Tiwi
Swaleh Mwavumbi	Tiwi

APPENDIX III: A list digo plant names, their botanical and standard English names

The list is ordered alphabetically by Digo names. Cf. also Appendix VI where linguistic analysis of some names is given

BOTANICAL NAME	DIGO NAME	STANDARD OR COMMON NAME
Panicum maximum Jacq.	Bondo	-
Pyrenacantha kaurabassana Baill.	Bundi	-
Solanum melongena L	Bungulia	Egg plant
Angraecum dives Rolfe.	Chiahira	Orchid
Ansellia africana Lindl.	Chiahira	Orchid
Tephrosia villosa (L.) Pers.	Chibalazi chanze	-
Tephrosia villosa (L.) Pers.	Chibalazi mlungu	-
Commiphora obovata Chiov.	Chibambara	-
Hypoestes forskaolei (Vahl) R. Br.	Chibaruti	-
Tabernaemontana elegans Stapf	Chibombo	-
Rauvolfia mombasiana Stapf	Chibombo ulimbo	-
Rhynchosia velutina Wight & Arn.	Chibugu	-
Indigofera trita L.f.	Chibugu chilume	-
Plicosepalus curviflorus (Benth.) Tiegh.	Chibugu sicho kolo	-
Secamone retusa N.E.Br	Chiburu madzi	-
Toddaliopsis sansibarensis (Engl.) Engl.	Chidimu tsaka	-
Harrisonia abyssinica Oliv.	Chidori	-
Barleria setigera Rendle	Chidungadunga	-
Commelina bracteosa Hassk.	Chidzedza	-
Erythroxylum emarginatum Thonn.	Chifumai	-
Haplocoelum mombasense Bullock	Chifunga sandzu	-
Scorodophloeus fischeri (Taub.) J.Léonard	Chifunga sandzu	-
Chazaliella abrupta (Hiern) Petit & Verdc.	Chigamba	-
Acacia seyal Del.	Chigundi	White galled Acacia, Whistling thorn tree
Phyllanthus amarus Schum. & Thonn.	Chihumbo utsungu	-
Cissampelos pareira L. var. *orbiculata* (DC.) Miq.	Chihumbohumbo	-
Hyphaene coriacea Gaertn.	Chikoko	-
Acacia adenocalyx Brenan & Exell	Chikombe tsui	-
Capparis viminea Oliv. var. *viminea*	Chikombe tsui	-
Stylochaeton salaamicus NE Br.	Chikonje	-
Stylochaeton salaamicus NE Br.	Nyaa	
Craibia brevicaudata (Vatke) Dunn	Chikunguni	-
Ludia mauritiana Gmelin	Chikunguni	-
Elaeodendron schweinfurthianum (Loes.) Loes	Chikunguni chilume	-
Rourea orientalis Baill	Chikuta manena	-
Cynometra webberi Bak.f.	Chikwadzu	-
Strychnos pangenesis Gilg	Chikwakwa	-
Dichapetalum arenarium Bret.	Chikwalakwala	-
Acacia mellifera (Vahl) Benth.	Chikwata kombe	-
Mkilua fragrans Verdc.	Chilua	-
Eleusine indica (L.) Gaertner	Chimbikaya	-
Leucas sp.	Chimvuno	-
Gardenia volkensii K.Schum. ssp. *Volkensii*	Chimwemwe	-
Oxygonum sinuatum (Meisn) Dammer.	Chindiri	Double thorn
Mkilua fragrans Verdc.	Chingade	-
Clerodendrum glabrum E. Mey.	Chinuka cha mmasai	-
Clerodendrum incisum Klotzsch	Chinuka	-
Clerodendrum incisum Klotzsch	Mtsatsa	
Acacia adenocalyx Brenan & Exell	Chinyakore	Acacia
Clausena anisata (Willd.) Benth.	Chinyapala	-

Appendix III Cont.

BOTANICAL NAME	DIGO NAME	STANDARD OR COMMON NAME
Phyllanthus delpyanus Hutch.	Chinyapala	-
Scutia myrtina (Burm.f.) Kurz	Chinyokola	-
Alchornea laxiflora (Benth.) Pax & K.Hoffm.	Chiphala kanga	-
Lantana viburnoides (Forssk.) Vahl	Chiphatsa chilume	-
Ocimum gratissimum L. var. *gratissimum*	Chirahani	-
Cissampelos pareira L. var. *orbiculata* (DC.) Miq.	Chisikio paka	-
Plicosepalus curviflorus (Benth.) Tiegh.	Chisikolo	-
Amaranthus graecizans L.	Chiswenya	-
Ormocarpum kirkii S. Moore	Chitadzi	-
Memecylon amaniense (Gilg) A. & R.Fernandes	Chitambuu	-
Striga asiatica (L.) O.Ktze.	Chitsai	Witchweed
Cola minor Brenan	Chitsamvia	-
Cordia somaliensis Bak.	Chitundo	-
Allium cepa L.	Chitunguu madzi	Onion
Allium sativum L.	Chitunguu saumu	Garlic
Ficus lutea Vahl	Chiuzi	Fig tree
Aganthisanthemum bojeri Klotzsch var *bojeri*	Chivuma nyuchi	-
Ocimum suave Willd.	Chivumbani	-
Triumfetta rhomboidea Jacq.	Chivumbani cha chigala	-
Aganthisanthemum bojeri Klotzsch var *bojeri*	Chivundza kesi	-
Synadenium pereskiifolium (Baill.) Guill.	Chiyuyu	-
Synadenium pereskiifolium (Baill.) Guill.	Tupa	-
Euphorbia hirta L.	Chiziyaziya	Asthma weed
Sansevieria kirkii Baker	Chongwa	-
Psilotrichum sericeum (Roxb.)Dalz	Demu	-
Tylophora sp.	Dokadoka	-
Commelina benghalensis L.	Dzedza	Wandering Jew
Plectranthus flaccidus Guerke	Fuka	-
Asystasia gangetica (L.) T. Anders.	Futswe	-
Melanthera biflora (L.) Wild	Futswe ra pwani	-
Plectranthus tenuiflorus Vatke	Galagala tsui	-
Euphorbia nyikae Pax	Ganga	-
Panicum maximum Jacq.	Gogwe	-
Aloe spp.	Golonje	-
Adenia gummifera (Harv.) Harms	Gore	-
Lawsonia inermis L.	Hina	Henna
Ormocapum sennoides DC.	Humbo ra nguluwe	-
Hypoestes aristata Soland. ex Roem & Schult.	Jirimata futswe	Purple Haze
Pupalia lappacea (L.) Juss.	Jirimata kulu	-
Cenchrus mitis Anderss.	Jirimata lume	-
Brassica oleracea var. *capitata*	Kabichi	Cabbage
Jateorhiza palmata (Lam.) Miers.	Kalumwa	-
Syzygium aromatic (L.) Merr. et Perry	Karafuu	Clove
Daucus carota L.	Karoti	Carrot
Commelina bracteosa Hassk.	Kongwe chetu	-
Commelina forskaolii Vahl	Kongwe lume	-
Vigna unguiculata (L.) Walp	Kunde	Cow pea
Gonatopus boivinii (Decne.) Engl.	Kundzwi	-
Parquetina nigrescens (Afzel.) Bullock	Libugu pamba	-
Indigofera sp.	Lihago	-
Abelmoschus esculentus (L.) Moench.	Mabenda	Okra, lady finger
Maytenus undata (Thunb.) Blakelock	Machende ga mnyau	-
Manihot esculenta L.	Manga	Cassava
Dioscorea astericus Burkill	Mani	-
Zea mays L	Mapemba	Maize, corn

Appendix III Cont.

BOTANICAL NAME	DIGO NAME	STANDARD OR COMMON NAME
Phaseolus vulgaris L.	Maragwe	Kidney bean
Zea mays L	Matsere	Maize, corn
Cajanus cajan (L.) Millsp.	Mbalazi	Pigeon pea
Afzelia quanzensis Welw.	Mbambakofi	Mahogany
Commiphora africana (A.Rich.) Engl.	Mbambara	-
Commiphora lindensis Engl.	Mbambara	-
Abutilon mauritianum (Jacq.) Medic.	Mbangula mavi	-
Abutilon zanzibaricum Mast.	Mbangula mavi	-
Euphorbia hirta L.	Mbatata	Asthma weed
Caesalpinia bonduc (L.) Roxb.	Mbate	-
Grewia ectasicarpa S. Moore	Mbavubavu	-
Grewia holstii Burret	Mbavubavu	-
Premna resinosa (Hochst.) Schauer	Mbavubavu mdide	-
Grewia forbesii Mast.	Mbavubavu mkulu	-
Ampelocissus africana (Lour.) Merr.	Mbebeneka	-
Anacardium occidentale L.	Mbibo	Cashew nut
Mimosa pudica L.	Mbodzebodze	-
Biophytum petersianum Klotzsch	Mbodzembodze	-
Psychotria lauracea (K. Schum) E.M.A. Petit	Mbogaboga	-
Bougainvillea spp.	Mboganvila	Bougainvillea
Ancylobotrys petersiana (Kl.) Pierre	Mbohoya	-
Annona senegalensis Pers.	Mbokwe	Wild custard apple
Trema orientalis (L.) Bl.	Mbonobono	-
Bourreria nemoralis (Gürke) Thulin	Mbunduchi	-
Sida acuta Burm. f.	Mbundugo	-
Caesalpinia bonduc (L.) Roxb.	Mburuga	-
Citrus reticulata Blanco.	Mchendza	Tangerine
Lagenaria siceraria (Molina) Standley	Mchiburu	Calabash gourd
Amaranthus hybridus L.	Mchicha	Amaranth
Dichrostachys cinerea (L.) Wight & Arn.	Mchinjiri	Chinese lantern tree
Celtis mildbraedii Engl.	Mchiza tsaka	African celtis
Xylopia parviflora (A.Rich.) Benth.	Mchiza tsaka	-
Hyparrhenia sp.	Mchuchi	-
Lannea schweinfurthii (Engl.) Engl. var. *stulmannii* (Engl.) Kokwaro	Mchumbu	-
Lannea schweinfurthii (Engl.) Engl. Var. *acuminata* (Engl.) Kokwaro	Mchumbu madzi	-
Citrus sinensis (L.) Osbeck	Mchungwa	Sweet orange
Gyrocarpus americanus Jacq.	Mchusa	-
Commiphora pteleifolia Engl.	Mdandachindi	-
Citrus aurantium L.	Mdandzi	Sour orange
Antidesma venosum Tul.	Mdanga tsongo	-
Commiphora zanzibarica (Baill.) Engl.	Mdege	-
Hyparrhenia sp.	Mdembe	-
Hyperthelia dissoluta (Nees ex Steud) Clayton	Mdembe	Thatching grass
Maclura africana (Bureau) Corner	Mdhahabu	-
Citrus aurantiifolia (Christm.) Fam. Swingle	Mdimu	Lime
Hunteria zeylanica (Retz.) Gardn. var. *africana*	Mdimu tsaka	-
Suregada zanzibariensis Baill.	Mdimu tsaka	-
Cissus rotundifolia (Forssk.) Vahl.	Mdokadoka	-
Cissus sylvicola Masinde & Newton	Mdokadoka	-
Cissus quinquangularis Chiov.	Mdokadoka	-
Cissus rotundifolia (Forssk.) Vahl.	Mbugububu	-
Cissus sylvicola Masinde & Newton	Mbugububu	-
Cissus quinquangularis Chiov.	Mbugububu	-
Salacia madagascariensis (Lam.) DC.	Mdoma	-

Appendix III Cont.

BOTANICAL NAME	DIGO NAME	STANDARD OR COMMON NAME
Salacia madagascariensis (Lam.) DC.	Mwambaro	-
Bridelia micrantha (Hochst.) Baill.	Mdudu	-
Synsepalum kassneri (Engl.) T.D. Penn.	Mdulu	-
Zanthoxylum chalybeum Engl. ssp. *chalybeum*	Mdungu	-
Bruguiera gymnorrhiza (L.) Lam.	Mdzago	Mangrove
Antidesma venosum Tul.	Mdzenga tsongo	-
Catunaregam nilotica (Stapf) Tirvengadum	Mdzongodzongo	-
Garcinia livingstonei T. Anders	Mfidzofidzo	-
Vitex payos (Lour.) Merr.	Mfudu	-
Vitex mombassae Vatke	Mfudu madzi	-
Vitex doniana Sweet	Mfudu unga	Black plum
Canthium kilifiensis Bridson ined.	Mfumula ndolwa	-
Cynometra suaheliensis (Taub.) Bak.f.	Mfunda	-
Sterculia appendiculata K. Schum.	Mfune	Mgude
Schlechterina mitostemmatoides Harms	Mfunga nyama	-
Garcinia livingstonei T. Anders	Mfunga sandzu	-
Haplocoelum inoploeum Radlk.	Mfunga sandzu	-
Entada rheedii Spreng	Mfwihi	-
Bourreria nemoralis (Gürke) Thulin	Mfyofyo	-
Feretia apodanthera (Del.)	Mfyofyo	-
Heinsia crinita (Afz.) G.Tayl.	Mfyofyo	-
Sclerocarya birrea (A. Rich.) Hochst.	Mg'ongo	Morula
Mimusops somaliensis Chiov.	Mgama	-
Ficus bussei Mildbr. & Burret	Mgandi	Fig tree
Ficus faulkneriana C.C.Berg	Mgandi	Fig tree
Ficus sycomorus L.	Mgandi	Fig tree
Stereospermum kunthianum Cham.	Mgodo	
Musa spp.	Mgomba	Banana
Hoslundia opposita Vahl	Mgongolo	-
Cyphostemma adenocaule (Steud.) Descoings	Mgongolo mlume	-
Sterculia rhynchocarpa K. Schum.	Mgoza	-
Antiaris toxicaria (Pers.) Lesch.	Mgua	False Mvule, False Iroko
Acacia stuhlmannii Taub.	Mgunga	Fever tree
Ziziphus mucronata Willd. ssp. *mucronata*	Mgungune	Buffalo thorn
Catha edulis (Vahl) Forsk ex Endl.	Miraa	Khat, Abyssinian tea
Zanthoxylum chalybeum Engl. ssp. *chalybeum*	Mjafari	-
Lantana camara L.	Mjasasa	Devil's weed, Tick berry
Pandanus kirkii Rendle	Mkadi	Screw pine
Tetracera boiviniana Baill.	Mkala fisi	-
Bridelia cathartica Betrol. F.	Mkalakala	-
Phyllanthus reticulatus Poir	Mkambakamba	-
Monodora grandidieri Baill.	Mkele	-
Crotalaria emarginata Boj.	Mkelekele	-
Rinorea elliptica (Oliv.) O.Ktze.	Mkete	-
Streblus usambarensis (Engl.) C.C.Berg	Mkete	-
Streblus usambarensis (Engl.) C.C.Berg	Msusu	-
Vitellariopsis kirkii (Baker) Dubard	Mkilishangwe	-
Thevetia peruviana (Pers.) K. Schum.	Mkode	Yellow Oleander, LuckyNut
Avicennia marina (Forssk.) Vierh.	Mkoko	-
Bruguiera gymnorrhiza (L.) Lam.	Mkoko	Mangrove
Rhizophora mucronata Lam.	Mkoko	Mangrove
Sideroxylon inerme L.	Mkoko bara	-
Sideroxylon inerme L.	Mkoko mwitu	-
Hyphaene compressa H. Wendl.	Mkoma	Doum palm
Grewia plagiophylla K. Schum.	Mkone	-

Appendix III Continued

BOTANICAL NAME	DIGO NAME	STANDARD OR COMMON NAME
Grewia densa K. Schum.	Mkone chibugu	-
Balanites wilsoniana Dawe & Sprague	Mkonga	-
Combretum schumannii Engl.	Mkongolo	Mgurure
Ellipanthus hemandradenioides Brenan	Mkongolo mwiru	-
Combretum paniculatum Vent. ssp. *paniculatum*	Mkongolo wa kundu	-
Musa spp.	Mkoo	Banana
Rhoicissus revoilii Planch.	Mkororoi	-
Anacardium occidentale L.	Mkorosho	Cashew nut
Grevea eggelinga	Mkota wongo	-
Whitfieldia elongate (Beauv.) C.B.Cl.	Mkula usiku	-
Diospyros cornii Chiov.	Mkulu	-
Adansonia digitata L.	Mkulu kazingwa	-
Vepris lanceolata (Lam.) G. Don	Mkumba mbega	-
Ziziphus mauritiana Lam.	Mkunazi	-
Terminalia catappa L.	Mkungu	Bastard/ Indian almond
Guettarda speciosa L.	Mkungu wa pwani	-
Sorindeia madagascariensis DC.	Mkunguma	-
Digitaria milanjiana (Rendle) Stapf	Mkuse	-
Synaptolepis kirkii Oliv.	Mkuta manena	-
Julbernardia magnistipulata (Harms) Troupin.	Mkuwa	-
Ficus lutea Vahl	Mkuyu	Fig tree
Ficus sur Forssk.	Mkuyu	Fig tree
Tamarindus indica L.	Mkpwadzu	Tamarind
Strychnos madagascariensis Poir.	Mkpwakpwa	-
Phyllanthus reticulatus Poir	Mkpwamba lungo	-
Flueggea virosa (Willd.) Voigt.	Mkpwamba mchetu	-
Flueggea virosa (Willd.) Voigt.	Mkpwamba vitu	-
Monodora grandidieri Baill.	Mkwele	-
Diospyros greenwayi F.White	Mlala	-
Monodora grandidieri Baill.	Mlala mwereru	-
Diospyros kabuyeana F.White	Mlala mwiru	-
Carpodiptera africana Mast.	Mlanga	-
Fernandoa magnifica Seem.	Mlangalangazuka	-
Plicosepalus curviflorus (Benth.) Tiegh.	Mlangamia	-
Cananga odorata (Lam.) Hook.f. & Thoms.	Mlangilangi	-
Pleurostelma cernuum (Decne.) Bullock	Mlazakoma	-
Newtonia paucijuga (Harms) Brenan	Mleha	Mdadarika
Citrus limon (L.) Burm.	Mlimau	Lemon
Synaptolepis kirkii Oliv.	Mlunga njira	-
Polysphaeria multiflora Hiern	Mmangwi	-
Tricalysia ovalifolia Hiern	Mmangwi Mmangitovu	-
Manilkara mochisia (Bak.) Dubard	Mnago	-
Cola uloloma Brenan	Mnapu	-
Solanum nigrum L.	Mnavu	Black nightshade
Scadoxus multiflorus (Martyn) Raf. ssp. *katharinae* (Bak.) Friis & Nordal	Mnazi wa nyoka	-
Siphonochilus brachystemon (K. Schum) BL. Burtt.	Mnazi wa nyoka	-
Erianthemum curvirameum (Engl.) Wiens & Polh.	Mnazi wa tsozi	-
Manilkara discolor (Sond.) J.H. Hemsl.	Mng'ambo	-
Brackenridgea zanguebarica Oliv.	Mng'andu	-
Crossopteryx febrifuga (G. Don) Benth.	Mng'andu	-
Gossypioides kirkii (Mast.) J.B.Hutch.	Mngagamwe	-
Ziziphus robertsoniana Beentje sp. nov ined	Mng'ambo	-
Antiaris toxicaria (Pers.) Lesch.	Mnguonguo	False Mvule, False Iroko
Xylopia parviflora (A.Rich.) Benth.	Mngwa nyahi	-

Appendix III Cont.

BOTANICAL NAME	DIGO NAME	STANDARD OR COMMON NAME
Uvaria acuminate Oliv.	Mngwene	-
Monanthotaxis fornicata (Baill.) Verdc.	Mngwene mlume	-
Uvaria lucida Benth. ssp. *lucida*	Mngwene mlume	-
Monanthotaxis fornicata (Baill.) Verdc.	Mngweni madevu	-
Uvaria acuminata Oliv.	Mngweni mdide	-
Uvaria lucida Benth. ssp. *lucida*	Mngweni mkulu	-
Clerodendrum glabrum E. Mey.	Mnuka lovu	-
Pseudobersama mossambicensis (Sim.) Verdc.	Mnwa madzi	-
Cussonia zimmermannii Harms	Mnyala	-
Gigasiphon macrosiphon (Harms) Brenan	Mnyandza	-
Parkia filicoidea Oliv.	Mnyendze	-
Xylopia parviflora (A.Rich.) Benth.	Mnyinyi	-
Flacourtia indica (Burm.f.) Merrill	Mnyondoya	-
Oncoba spinosa Forssk.	Mnyondoya mchetu	-
Lannea schweinfurthii (Engl.) Engl. Var. *acuminata* (Engl.) Kokwaro	Mnyumbu	-
Lannea schweinfurthii (Engl.) Engl. var. *stulmannii* (Engl.) Kokwaro	Mnyumbu madzi	-
Stenotaphrum dimidiatum (L.) Brongn.	Mnyumbwe	-
Keetia lukei (D.M.Bridson)	Mnyundzu	-
Keetia venosa (Oliv.) Bridson	Mnyundzu	-
Keetia zanzibarica (Klotzsch) Bridson	Mnyundzu	-
Triumfetta rhomboidea Jacq.	Mnyururika	-
Waltheria indica L.	Mnyururika	-
Paullinia pinnata L.	Mongo wa mbulu	-
Markhamia zanzibarica (DC.) Engl.	Mpalawanda	-
Margaritaria discoidea (Baill.) Webster	Mpalika	-
Cordia goetzei Gürke	Mpamapama	-
Scorodophloeus fischeri (Taub.) J.Léonard	Mpande	-
Carica papaya L.	Mpapali	Pawpaw
Psidium guajava L.	Mpera	Guava
Leptactina platyphylla (Hiern) Wernh.	Mpera wa tsakani	-
Vismia orientalis Engl.	Mpera wa tsakani	-
Trema orientalis (L.) Bl.	Mpesi	-
Gloriosa superba L.	Mpewa	-
Acalypha fruticosa Forssk.	Mphatsa	-
Dalbergia melanoxylon Guill. & Perr.	Mphingo	African Ebony
Achyranthes aspera L.	Mphulula mbuzi	Devil's horsewhip
Oryza sativa L.	Mphunga	Rice
Dichrostachys cinerea (L.) Wight & Arn.	Mpingwa	Chinese lantern tree
Ormocapum sennoides DC.	Mpingwa	-
Landolphia kirkii Dyer	Mpira	-
Albizia anthelmintica Brongn.	Mporojo	-
Schizozygia coffaeoides Baill.	Mpukuse	-
Deinbollia borbonica Scheff.	Mpwakapwaka	-
Diospyros squarrosa Klotzsch	Mpweke	-
Dalbergia boehmii Taub. ssp. *boehmii*	Mrandze	-
Kigelia africana (Lam.) Benth.	Mratina	Sausage tree
Lecaniodiscus fraxinifolius Bak.	Mremero	-
Sesamum calycinum Welw.	Mrenda	-
Cucurbita maxima Duchesne	Mrenje	Pumkin
Dioscorea dumetorum (Kunth.) Pax	Mriga	-
Dioscorea sp.	Mriga yere	-
Brachystegia spiciformis Benth.	Mrihi	-
Paramacrolobium coeruleum (Taub.) Léonard	Mrihi	-
Pluchea dioscoridis (L.) DC.	Mrinda ziya	-

Appendix III Cont.

BOTANICAL NAME	DIGO NAME	STANDARD OR COMMON NAME
Stachytarpheta jamaicensis (L.) Vahl	Mruwa	Blue Porterweed
Commiphora edulis (Kl.) Engl.	Mryakwembe	-
Combretum schumannii Engl.	Mryanyani	-
Jatropha sp.	Msabuni	-
Ozoroa obovata (Oliv.) R. & A. Fernandes	Msalasanga	-
Drypetes natalensis (Harv.) Hutch.	Msambwe	-
Synsepalum subverticillatum (E.A. Bruce) Pennington	Msambwe	-
Ozoroa insignis Del. ssp. *reticulata* (Bak.f.) Gillett	Msangasanga	-
Ozoroa obovata (Oliv.) R. & A. Fernandes	Msangasanga	-
Ficus exasperata Vahl	Msasa	Fig tree
Diospyros ferrea (Willd.) Bakh.	Mshipa	-
Lantana camara L.	Mshomoro	Devil's weed, Tick berry
Grewia ectasicarpa S. Moore	Msokoto	-
Grewia holstii Burret	Msokoto	-
Ceiba pentandra (L.) Gaertn.	Msufi	Kapok
Bombax rhodognaphalon K. Schum.	Msufi mwitu	
Colubrina asiatica (L.) Brongn.	Msuko	-
Grewia holstii Burret	Msuko	-
Millettia usaramensis Taub.	Msumari bara	-
Commiphora africana (A.Rich.) Engl.	Msusu	-
Dobera loranthifolia (Warb.) Harms.	Msuwaki	-
Salvadora persica L.	Msuwaki	Toothbrush tree
Lycopersicon esculentum Mill.	Mtamata	Tomato
Hymenaea verrucosa Gaertn.	Mtandarusi	Gum copal tree
Cucumis sp.	Mtango koma	-
Catunaregam nilotica (Stapf) Tirvengadum	Mtengedzi	-
Caesalpinia bonduc (L.) Roxb.	Mtera	-
Dichapetalum madagascariense Poir.	Mtobwe	-
Oncoba spinosa Forssk.	Mtondoo	-
Calophyllum inophyllum L.	Mtondoro	-
Senna occidentale (L.) Irw. et Barn.	Mtsalafu	-
Lantana camara L.	Mtsambala	-
Synsepalum brevipes (Baker) Pennington	Mtsamvia	-
Albizia versicolor Oliv.	Mtsani ndzovu	-
Albizia adianthifolia (Schumach.) W.F.Wright	Mtsani tsiye	-
Encephalartos hildebrandtii A.Br. & Bouché var. *hildebrandtii*	Mtsapu	Cycad
Acalypha fruticosa Forssk.	Mtsatsa	-
Clerodendrum glabrum E. Mey.	Mtsatsa	-
Grewia glandulosa Vahl.	Mtsaye	-
Grewia vaughanii Exell	Mtsaye	-
Manilkara sulcata (Engl.) Dubard	Mtsedzi	-
Toddalia asiatica (L.) Lam.	Mtseha	-
Piliostigma thonningii (Schumach.) Milne-Redh.	Mtseketse	Camel's foot
Hoslundia opposita Vahl	Mtserere	-
Elaeis guineensis Jacq.	Mtsikitsi	Wild oil palm
Raphia farinifera (Gaertn.) Hyland	Mtsikitsi	Raffia palm
Boerhavia repens L.	Mtsimbikaya	-
Maytenus heterophylla (Eckl. & Zeyh.) Robson	Mtsokola ng'ongo	-
Rytigynia celastroides (Baill.) Verdc.	Mtsokola wongo	-
Drypetes reticulata Pax	Mtsomatsanje	-
Lamprothamnus zanguebaricus Hiern	Mtsome	-
Ochna mossambicensis Klotzsch.	Mtsometsome	-
Ochna thomasiana Engl. & Gilg	Mtsonga mahana	-
Turraea nilotica Kotschy & Peyr.	Mtsonga mwiko	-
Dichapetalum zenkeri Engl.	Mtsonga nyomba	-

Appendix III Cont.

BOTANICAL NAME	DIGO NAME	STANDARD OR COMMON NAME
Mildbraedia carpinifolia (Pax) Hutch.	Mtsonga nyomba	-
Polysphaeria multiflora Hiern	Mtsonga nyomba	-
Polysphaeria parvifolia Hiern	Mtsonga nyomba	-
Uvaria lucida Benth. ssp. *lucida*	Mtsonga nyomba	-
Agelaea pentagyna (Lam.) Baill	Mtsophe	-
Adenia kirkii (Mast.) Engl.	Mtsotsone	-
Croton megalocarpoides Friis & Gilbert	Mtsunduzi	-
Hibiscus micranthus L.f.	Mtsunga mbuzi	
Hibiscus micranthus L.f.	Mtsunga ng'ombe	-
Launaea cornuta (Oliv. & H.) C. Jeffrey	Mtsunga wa utsungu	Wild lettuce
Stylosanthes fruticosa (Retz.) Alston	Mtsungula	-
Deinbollia borbonica Scheff.	Mtsungurira kuzimu	-
Vernonia colorata Drake	Mtsungutsungu	-
Abutilon zanzibaricum Mast.	Mtsusa tsalu	-
Triumfetta rhomboidea Jacq.	Mtsusa tsalu	-
Waltheria indica L.	Mtsusa tsalu	-
Passiflora edulis Sims.	Mtunda	Passion fruit
Jasminum meyeri-johannis Engl.	Mtunda hofu	-
Sideroxylon inerme L.	Mtunda koma	-
Dichapetalum zenkeri Engl.	Mtundukula	-
Ximenea americana L.	Mtundukula	Wild plum
Solanum incanum L.	Mtungudza koma	Sodom apple
Jasminum meyeri-johannis Engl.	Muasumini wa tsakani	-
Mangifera indica L.	Muembe	Mango
Acacia zanzibarica (S.Moore) Taub.	Muhega kululu	Coast whistling thorn
Tacca leontopetaloides (L.) Kuntze	Muhi wa nyoka	-
Strychnos spinosa Lam.	Muhonga	-
Thespesia danis Oliv.	Muhowe	-
Brachylaena huillensis O. Hoffm.	Muhuhu	-
Senna singueana (Del.) Lock	Muhumba	-
Cassia abbreviata Oliv.	Muhumba tsaka	-
Pemphis acidula Forst.	Muinamia bahari	-
Ophrypetalum odoratum Diels	Muizu wa tsakani	-
Paramacrolobium coeruleum (Taub.) Léonard	Mukwe	-
Plectranthus tenuiflorus Vatke	Mumbu	-
Trichilia emetica Vahl.	Munwa madzi	-
Antidesma venosum Tul.	Muoga ivu	-
Holarrhena pubescens (Buch.-Ham) Wallich	Muolaga kuku	-
Ricinus communis L.	Muono	Castor oil plant
Turraea floribunda Hochst.	Muoza nyama	-
Turraea wakefieldii Oliv.	Muoza nyama	-
Diospyros squarrosa Klotzsch	Mutsi	-
Avicennia marina (Forssk.) Vierh.	Mutsu	-
Saba comorensis (Bojer) Pichon	Muungo	-
Premna hildebrandtii Güerke	Muurusa pungu	-
Adansonia digitata L.	Muuyu	Baobab
Saccharum officinarum L.	Muwa	Sugarcane
Millettia usaramensis Taub.	Mvamva	-
Memecylon sansibaricum Taub.	Mvamva wa tsakani	-
Casuarina equisetifolia L.	Mvinde	Whistling pine
Vangueria infausta Burch.	Mviru	-
Pluchea sordida (Vatke) Oliv. & Hiern	Mvua koe	-
Ochna thomasiana Engl. & Gilg	Mvua pweza	-
Plectranthus tenuiflorus Vatke	Mvuga	-
Premna chrysoclada (Boj.) Guerke	Mvuma	-

Appendix III Cont.

BOTANICAL NAME	DIGO NAME	STANDARD OR COMMON NAME
Borassus aethiopum Mart.	Mvumo	African fan palm
Acalypha neptunica Müll. Arg.	Mvundza jembe	-
Alchornea laxiflora (Benth.) Pax & K.Hoffm.	Mvundza jembe	-
Allophylus rubifolius (A.Rich.) Engl.	Mvundza jembe	-
Bourreria teitensis (Gürke) Thulin	Mvundza jembe	-
Grandidiera boivinii Jaub.	Mvundza jembe	-
Mallotus oppositifolius (Geisel.) Müll.Arg.	Mvundza jembe	-
Mildbraedia carpinifolia (Pax) Hutch.	Mvundza jembe	-
Allophylus pervillei Bl.	Mvundza kondo	-
Allophylus rubifolius (A.Rich.) Engl.	Mvundza kondo	-
Kigelia africana (Lam.) Benth.	Mvungunya	Sausage tree
Milicia excelsa (Welw.) C.C.Berg	Mvure	Mvule, Iroko
Davallia chaerophylloides (Poir.) Steud.	Mvwiko	Fern
Pteridium aquilinum (L.) Kuhn	Mvwiko	Bracken fern
Phyllanthus amarus Schum. & Thonn.	Mvyarira nyuma	-
Adenium obesum (Forssk.) Roem. & Schult.	Mwadiga	Desert Rose
Rhynchosia congensis Baker	Mwadiga	-
Xylopia parviflora (A.Rich.) Benth.	Mwahula tsaka	-
Combretum illairii Engl.	Mwamba ngoma	-
Erythrina sacleuxii Hua	Mwamba ngoma	-
Rinorea ilicifolia (Oliv.) O.Ktze. var. *ilicifolia*	Mwambala lutswa	-
Rottboellia exaltata (L.) Lf	Mwambanyama	Itch grass
Bridelia cathartica Betrol. F.	Mwambeberu	-
Cissus sp.	Mwamchitophyo	-
Cyphostemma buchananii (Planch.) Desc. ex Wild & RB Drumm	Mwamchiviza	-
Tragea furialis Boj.	Mwamdzavi	-
Abrus precatorius L. ssp *africana* Verdc.	Mwamsusumbika	-
Terminalia sambesiaca Engl. & Diels	Mwanga	Terminalia
Isolana cauliflora Verdc.	Mwangajine	-
Polyalthia stuhlmannii (Engl.) Verdc.	Mwangajine mchetu	-
Uvariodendron kirkii Verdc.	Mwangajine mlume	-
Abrus precatorius L. ssp *africana* Verdc.	Mwangala nyuchi	-
Terminalia prunioides Laws.	Mwarambe	Terminalia
Bombax rhodognaphalon K. Schum.	Mware	East African Bombax
Azadirachta indica A. Juss	Mwarubaini	Neem tree
Hibiscus sp. aff *vitifolius*	Mwejenje	-
Inhambanella henriquesii (Engl. & Warb) Dubard	Mwembe tsaka	-
Cyphostemma adenocaule (Steud.) Descoings	Mwenjere	-
Achyranthus emerginatus	Mweza	
Asparagus falcatus L. var. *falcatus*	Mwinika ndzovu	-
Asparagus sp.	Mwinika ngulu	-
Barringtonia racemosa (L.) Spreng.	Mworong'ondo	-
Ipomoea batatas (L.) Lam.	Myogwe	Sweet potato
Sideroxylon inerme L.	Myongoyongo	-
Syzygium cumini (L.) Skeels	Mzambarau	Java plum
Syzygium guineense (Willd.) DC.	Mzambarau	Mshiwi
Rauvolfia mombasiana Stapf	Mzigande	-
Triainolepis africana Hook. f.	Mzigande wa pwani	-
Securidaca longipendunculata Fres.	Mziji	Violet tree
Hunteria zeylanica (Retz.) Gardn. var. *africana*	Mziyaziya	-
Sideroxylon inerme L.	Mziyaziya	-
Asteranthe asterias (S. Moore) Engl. & Diels ssp. *asterias*	Mzondohera nguluwe	-
Cordia monoica Roxb.	Mzondohera nguluwe	Sand paper tree
Tetracera boiviniana Baill.	Mzondohera nguluwe	-

Appendix III Cont.

BOTANICAL NAME	DIGO NAME	STANDARD OR COMMON NAME
Uvariodendron kirkii Verdc.	Mzondohera nguluwe	-
Cymbopogon citrates (Nees) Stapf	Mzumaa	Lemon grass
Ananas comosus (L.) Merr.	Nanansi	Pineapple
Cocos nucifera L.	Nazi	Coconut
Eugenia sp.	Nchibandu	-
Melanthera biflora (L.) Wild	Nchidoka	-
Diphasia sp. A	Nchikoma	-
Ehretia amoena Klotzsch	Nchikoma	
Ehretia bakeri Britten	Nchikoma	-
Vepris euginiifolia (Engl.) Verdoorn	Nchikoma	-
Blighia unijugata Bak.	Nchivuri	-
Chytranthus obliquinervis Engl.	Nchivuri mlume	-
Mariscus spp.	Ndago lume	-
Kyllinga erecta (Schum.)	Ndago munda	Creeping sedge, watergrass
Cyperus rotundus L.	Ndago ziya	Nutgrass, watergrass
Heteropogon contortus (L.) Beauv.	Nguji	-
Synaptolepis kirkii Oliv.	Njira mbiri	-
Vigna subterranea (L.) Verdc.	Njugu mawe	Bambara nut
Arachis hypogaea L.	Njugu nyasa	Groundnut, Peanut
Carissa bispinosa (L.) Desf. Ssp. *bispinosa*	Nvuje ya nze	-
Persea americana Mill.	Ovakado	Avocado
Gossypioides kirkii (Mast.) J.B.Hutch.	Pamba mwitu	-
Vernonia hildebrandtii Vatke	Phatsa	-
Corchorus olitorius L.	Phombo	-
Senecio cydoniifolius O. Hoffm.	Phoza	-
Phaseolus aureus Roxb.	Podzo	Green gram
Hyptis suaveolens Poit.	Pungahewa	-
Solanecio angulatus (Vahl.) C.Jeffrey	Reza	-
Brassica oleracea var. *acephala*	Sukumawiki	Kale
Zingiber officinale Rosc.	Tangawizi	Ginger
Phoenix dactylifera L.	Tende	Date palm
Vigna subterranea (L.) Verdc.	Tendegwa mawe	Bambara nut
Bidens pilosa L.	Todza	Blackjack
Heteropogon contortus (L.) Beauv.	Todza	-
Nymphoides forbesiana (Griseb.) Kuntze	Toro	-
Nymphaea sp.	Toro ndide	-
Solanum macrocarpon L.	Mtungudza	African egg plant
Vitex zanzibarensis Vatke	Ubani wa pwani	-
Phoenix reclinata Jacq.	Uchindu	-
Sesamum orientale L.	Ufuha	Sesame
Julbernardia magnistipulata (Harms) Troupin.	Ukwe	-
Gonatopus boivinii (Decne.) Engl.	Ulanga	-
Tacca leontopetaloides (L.) Kuntze	Ulanga	-
Mucuna pruriens (L.) DC.	Uphupu	Buffalo bean
Acokanthera schimperi (A.DC.) Schweinf.	Utsungu	-
Ficus stuhlmannii Warb.	Uuzi kaha	Fig tree
Solanum tuberosum L.	Viazi	Irish potato
Ocimum gratissimum L. var. *gratissimum*	Vumbamanga	-
Dioscorea sansibariensis Pax	Vwivwi koma	-
Pseudovigna argentea (Willd.) Verdc.	Yogweyogwe	-

Appendix III Cont.

BOTANICAL NAME	DIGO NAME	STANDARD OR COMMON NAME
Mushrooms[8]		
Russula aeruginea Lindblad	Nimakoba mwereru	-
Russula aquosa Leclair.	Nimakoba wa kundu	-
Russula paludosa Britz.	Hako ra nyani	-
Termitomyces spp.	Nkuvi	-
Termitomyces sp.	Choga nyama	-
Lactarius spp.	Nimaziya	The milky caps
Calvatia spp., *Lycoperdon* spp.	Tumbaku ya fisi	Puffballs
Ganoderma spp.	Dzogalele	-
-	Nimahembo	-
-	Chibazi	-
-	Mwatsaka	-
-	Chidzogolo	-
-	Nlumbwi	-
-	Mwatsaka	-
-	Nchikalango	-
-	Chidzogolo	-
-	Nlikosi	-
-	Gadugadu	-
-	Nimarondo	-

[8] Some mushroom species still had their identification undone by the time this thesis was written.

APPENDIX IV: Aspects of Chidigo structure and affiliation

Digo diachronic relationships

The language spoken by the Digo, Chidigo, is one of the nine *Midzichenda* languages. The nearest relatives of the *Midzichenda* languages are Swahili and Pokomo. These three language units have been classified together by Nurse and Hinnebusch (1993) as the Sabaki group, which again is part of what those authors call North East-coast Bantu. The concept of a Sabaki branch is backed by a number of regular phonological, grammatical, and lexical correspondences. These correspondences include plant names. Nurse and Hinnebusch (1993) have also presented re-constructions at various levels, i.e., for proto-*Midzichenda* and for proto-Sabaki. However, it should be borne in mind that re-constructing lexemes within *Midzichenda* and within Sabaki, i.e., within a dialect continuum, is problematic in so far as the closeness and mutual intelligibility of the languages allows for easy transfer, so that contact phenomena are not always clearly distinguishable from genetic heritage.

Language structure

Phonology

Vowels

Digo has 5 vowels: a, e, i, o, u, pronounced as in Swahili (Nurse & Hinnebusch 1993), e.g.

a - *ga-da* [peel], is pronounced as in Swahili *ga-ri* [car]

e - *te-mbe* [seed], is pronounced as in Swahili *te-mbea* [walk]

i - *bi-bo* [cashew fruit], is pronounced as in Swahili *bibi* [lady]

o - *to-sa* [nearly ripe], is pronounced as in Swahili *to-ka* [get out]

u - *ru-wa* [flower], is pronounced as un Swahili *ru-husa* [permission]

Consonants

The table below (Table D1) sets out a Digo consonant system, adapted from the Giriama consonant Table in Nurse & Hinnebusch (1993).

Table D1: Table of Digo consonants

Manner of articulation		**Place of articulation**				
		Labial	Alveolar/dental	palatal	velar	labiovelar
Stops	Voiceless	p	(t)	ch	k	kp
	Voiced	b	d	j	g	gb
Affricates	Voiced		ts			
	Voiceless		dz			
Fricatives	Voiceless	f	S	sh		
	Voiced	ph	dh, z	ź		
Continuants		w	l, r	y	h	
Nasals		m	n	ny	ng'	

The symbols used in the table are the standard phonetic ones, except for dh, sh, ny and ng' which are used as in Swahili orthography (Nurse & Hinnebusch 1993), and have here been used in Digo orthography. In addition the ph in Digo orthography has been taken to stand for phonetic v. *Midzichenda* languages distinguish an alveolar t

from a dental one. Since the distinction is not made in the orthography made so far, and since it could not be checked on the nature of t for each word, the existing orthography has been followed by reducing the two ts to one. Thus the table has been simplified, and does not distinguish between bi-labials and labio-dentals, so that f and ph appear in the same labial column.

Vowels after 'h' are nasalised, and for this reason one also finds the spelling /nh/, cf. *munhi* instead of *muhi* (Dammann 1936). Since the nasalisation is automatic, it was not found necessary to indicate it in writing. Dammann (1936) who has published Digo folk tales from the Tanga area, also uses the five vowels and the following consonants: the stops p, b, t, d, k, g, aspirated: stops ph, th, kh, fricatives v̲, v, f, s, z, š, ž, h (with a remark on nasality), and affricates ts, dz, tš, dž. Dammann also has the nasals indicated in the table above, plus an additional labiovelar nasal m̀. As for liquids Dammann uses r which is adequate for southern Digo. Finally he has the continuants w, y.

As noted by Nurse & Hinnebusch (1993), which correspond to observations in this study, ž is very rare in Digo.

Dialects

Among the Kenyan Digo speakers there are two distinct groups, characterised by variation in dialect interchange between r and l. While in south (Kinondo to Lungalunga) r replaces l in pronunciation, in some words the r is interchanged with l in north (Ukunda to Likoni). The speakers are aware of this variation, and although 'immigrant' speakers switch to the dialect of the host group, it usually takes time. These differences are traceable in plant names e.g. *Mkalakala* in the north could be identified as *Mkarakara* in south.

Tone

Similar to a number of Bantu languages in the East African coast, Digo is a so-called reduced tone language (Philippson 1993). As a somewhat simplified statement it can be said that the reduction for Digo consists in the fact that not all syllables of a given word are tonally relevant. Strictly speaking however, it would have required that the tone for the Digo word is indicated in the presented text. This however, has not been practised so far as there were no examples to follow, and the tonal analyses existing are far from exhaustive. Therefore tone in the presentation has been disregard.

Morphology

In the morphology of Chidigo, one finds the well-known Bantu noun class system which is presented here in the way established in Bantu studies. Bantu languages were originally called class languages in distinction to gender languages. Gender languages have a sex reference for all nouns, i.e. masculine, feminine or neuter, as *der Mann*, *die Frau*, and *das Kind* in German. Class languages do not have gender reference but have a difference in referring to classes of objects e.g. human beings, animals, plants, things. In modern grammatical treatments the term 'class' is replaced by 'non-sex gender'. The non-sex gender system exemplified here for Digo retains the established enumeration of classes for Bantu. The classes are organised in pairs and their relation is one of number, e.g. class 2 is the plural of class 1, etc. The following is an overview of primary noun classes of Digo, which have a predetermined prefix for each class:

Class 1 - has prefix *m(u)*	Class 2 - has prefix *a*	e.g. *mutu* [person]	*atu* [people]
Class 3 – prefix *m(u)*	class 4 - prefix *mi*	e.g. *muhi* [tree]	*mihi* [trees]

Class 5 – Zero prefix	Class 6 – prefix *ma*	e.g. *embe* [mango]	*maembe* [mangoes]
Class 7 – has prefix *chi*	Class 8 – has prefix *vi*	e.g. *Chitu* [thing]	*vitu* [things]
Class 9 – N	Class 10 - N	e.g. *ndimu* [lime fruit]	*ndimu* [lime fruits]
Class 11 – has prefix *li*	Class 10 – N	e.g. *lilimi* [tongue]	*ndimi* [tongues]
Class 12 and 13	do not exist in Digo		
Class 14 – *u*	abstract has no plural	e.g. *ure, uzito, ubaya* [length, weight, evil]	
Class 15 – *ku*	infinitive	e.g. *kugomba* [to speak], *kutsimba* [to dig], *kurema* [to refuse]	

Derived prefix attachment (Secondary prefix)

Apart from the primary prefixes given above, the so-called secondary prefixes may be used instead. These prefixes add specifications of size viz. diminutive and augmentative. These prefixes are also known as derived prefixes, and they include:

*Chi_*	*vi_*	e.g. *chidzihi* [small tree]	*vidzihi* [small trees]
*dzi_*	*madzi_*	e.g. *dzibugu* [large climber]	*madzibugu* [large climbers]

As for climber plants, the augmentative prefix *dzi* is interchangeable with *li*, i.e. *dzibugu*[large climber] and *libugu* [large climber].

In Digo, as in any Bantu language, the class system is characterized by verbal concord or agreement, i.e. the class membership of a given noun is repeated in dependant word categories such as adjective, verb and pronoun. The following is a list of nominal concord:

Mutu aredza	a_	Mutu wa Nairobi
Atu aredza	a_	Atu a Nairobi
Muhi ukagwa	u_	Muhi wa tsakani
Mihi ikagwa	i_	Mihi ya tsakani
Embe rikagwa	ri_	Embe ra chidigo
Maembe gakagwa	ga_	Maembe ga chidigo
Chitu chikagwa	chi_	Chitu cha mayo
Vitu vikagwa	vi_	Vitu vya mayo
Ndimu ikagwa	i_	Ndimu ya utsungu
Ndimu zikagwa	zi_	Ndimu za utsungu
Lilimi rinaluma	ri_	Lilimi ra ng'ombe
Ndimi zinaluma	zi_	Ndimi za ng'ombe
Ulaya iredza	i_	Ulaya ya Kwale

The table below (Table D2) presents a summary of the Digo class prefixes, which include the nominal, verbal and pronominal prefixes.

Table D2: Digo class prefixes

Class	NP	VP	PP
1	mu	a	u
2	a	a	a
3	mu	u	u
4	mi	i	ya
5	0	ri	ra
6	ma	ga	ga
7	chi	chi	cha
8	vi	vi	vya
9	N	i	ya
10	N	zi	za
11	li	ri	ra
14	u	zi	za
15	ku	i	ya

Notes: NP – Nominal prefix; VP – Verbal prefix; and PP – Pronominal prefix; N – stands for a homorganic nasal.

Although classes 9 and 10 have identical nominal prefix (NP) there is an underlying difference which comes out in the dependant prefixes, i.e. /i/ for class 9 and /zi/ for class 10.

APPENDIX V: Notes on Digo plant identification processes and the features used (n= 236)

(The list is ordered in alphabetic order by Digo names)

BOTANICAL NAME	LIFE FORM	DIGO NAME	IDENTIFICATION DETAILS (human senses and plant features used)
Panicum maximum	Grass	Bondo	Visual aspects of leaves and inflorescence
Pyrenacantha kaurabassana	Liana	Bundi	Visual features of the leaves and the tuber
Angraecum dives	Epiphyte	Chiahira	Visual aspects of whole plant
Ansellia africana			
Tephrosia villosa	Herb	Chibalazi chanze	Visual features of the leaves were used
Commiphora lindensis	Tree	Chibambara	Visual aspects of leaves and stems
Hypoestes forskaolei	Herb	Chibaruti	Visual aspects of leaves and fruits
Tabernaemontana elegans	Tree	Chibombo	Visual aspects of leaves, presence of latex
Rhynchosia velutina	Liana	Chibugu	Visual aspects of leaves
Rhynchosia congensis	Liana	Chibugu chichetu	Visual aspects of leaves
Indigofera trita	Herb	Chibugu chilume	Visual aspects of leaves
Plicosepalus curviflorus	Liana	Chibugu sicho kolo	Visual aspects of whole plant
Secamone retusa	Herb	Chiburu madzi	Visual aspects of leaves
Toddaliopsis sansibariensis	Shrub	Chidimu tsaka	Visual aspects of leaves and aromatic features
Harrisonia abyssinica	Shrub	Chidori	Visual aspects of leaves
Barleria setigera	Shrub	Chidungadunga	Visual aspects of leaves
Scorodophloeus fischeri	Tree	Chifunga sandzu	Visual aspects of leaves
Phyllanthus amarus	Herb	Chihumbo utsungu	Visual aspects of whole plant
Hyphaene coriaceae	Tree	Chikoko	Visual aspects of leaves, stem and fruits
Capparis viminea	Shrub	Chikombe tsui	Visual aspects of leaves
Acacia adenocalyx			
Craibia brevicaudata	Tree	Chikunguni	Visual aspects of leaves
Ludia mauritiana			
Cynometra webberi	Tree	Chikwadzu	Visual aspects of leaves
Acacia mellifera	Tree	Chikwata kombe	Visual aspects of leaves
Mkilua fragrans	Shrub	Chilua	Visual aspects of leaves and flowers, and aromatic of flowers
Gardenia volkensii	Shrub	Chimwemwe	Visual aspects of leaves
Oxygonum sinuatum	Herb	Chindiri	Visual aspects of leaves and fruits
Clerodendrum glabrum	Shrub	Chinuka cha mmasai	Visual aspects and aromatic features of leaves
Clausena anisata	Herb	Chinyapala	Visual aspects of leaves
Lantana viburnoides	Shrub	Chiphatsa chilume	Visual aspects of leaves
Cissampelos pareira	Herb	Chisikio paka	Visual aspects of leaves
Ormocarpum kirkii	Tree	Chitadzi	Visual aspects of leaves
Striga asiatica	Herb	Chitsai	Visual aspects of whole

Appendix V Cont.

BOTANICAL NAME	LIFE FORM	DIGO NAME	IDENTIFICATION DETAILS (human senses and plant features used)
Cola minor	Tree	Chitsamvia	Visual aspects of leaves
Encephalartos hildebrandtii	Shrub	Chitsapu	Visual aspects of leaves
Cordia somaliensis	Shrub	Chitundo	Visual aspects of leaves
Aganthisanthemum bojeri	Herb	Chivuma nyuchi	Visual aspects of leaves
Ocimum suave	Herb	Chivumbani	Visual aspects and aromatic features of leaves
Synadenium pereskiifolium	Shrub	Chiyuyu	Visual aspects of whole plant and corrosive latex (on touch)
Euphorbia hirta	Herb	Chiziyaziya	Visual aspects of leaves and presence of latex
Psilotrichum serisum	Herb	Demu	Visual aspects of leaves
Plectranthus flaccidus	Herb	Fuka	Visual aspects of leaves
Asystasia gangetica	Herb	Futswe	Visual aspects of leaves
Melanthera biflora	Herb	Futswe ra pwani	Visual aspects of leaves
Plectranthus tenuiflorus	Herb	Galagala tsui	Visual aspects and taste features of leaves
Euphorbia nyikae	Shrub	Ganga	Visual aspects of whole plant and corrosive latex (on touch)
Aloe sp.	Shrub	Golonje	Visual aspects of leaves
Adenia gummifera	Liana	Gore	Visual aspects of leaves and stem
Hypoestes aristata	Herb	Jirimata futswe	Visual aspects of fruits
Cenchrus mitis	Grass	Jirimata lume	Visual aspects of fruits
Commelina bracteosa	Grass	Kongwe chetu	Visual aspects of leaves
Commelina forskaolii	Grass	Kongwe lume	Visual aspects of leaves
Sansevieria kirkii	Shrub	Konje tsaka	Visual aspects of leaves
Parquetina nigrescens	Liana	Libugu pamba	Visual aspects of leaves and fruits
Indigofera sp.	Herb	Lihago	Visual aspects of leaves
Erythrina sacleuxii	Tree	Mbamba ngoma	Visual aspects of leaves and stem
Afzelia quanzensis	Tree	Mbambakofi	Visual aspects of leaves and stem
Abutilon zanzibaricum	Shrub	Mbangula mavi	Visual aspects of leaves
Premna resinosa	Shrub	Mbavubavu mdide	Visual aspects of leaves
Grewia forbesii	Shrub	Mbavubavu mkulu	Visual aspects of leaves
Biophytum petersianum	Herb	Mbodzembodze	Visual aspects and desiccation (on touch) of leaves
Mimosa pudica			
Ancylobotrys petersiana	Liana	Mbohoya	Visual aspects of leaves, fruits and stem
Annona senegalensis	Shrub	Mbokwe	Visual aspects of leaves and fruits
Bourreria nemoralis	Shrub	Mbunduchi	Visual aspects of leaves and fruits
Caesalpinia bonduc	Shrub	Mburuga	Visual aspects of leaves and fruits
Dichrostachys cinerea	Tree	Mchinjiri	Visual aspects of leaves
Xylopia parviflora	Tree	Mchiza tsaka	Visual aspects of leaves and growth form of whole plant
Lannea schweinfurthii ssp. *stuhlmannii*	Tree	Mchumbu	Visual aspects of leaves

Appendix V Cont.

BOTANICAL NAME	LIFE FORM	DIGO NAME	IDENTIFICATION DETAILS (human senses and plant features used)
Lannea schweinfurthii ssp. *acuminata*	Tree	Mchumbu madzi	Visual aspects of leaves
Commiphora pteleifolia	Tree	Mdandachindi	Visual aspects of leaves and stem
Hyparrhenia sp.	Grass	Mdembe	Visual aspects of stem
Maclura africana	Shrub	Mdhahabu	Visual aspects of leaves and stem
Suregada zanzibariensis	Tree	Mdimutsaka	Visual aspects and aromatic features of leaves
Hunteria zeylanica			
Cissus rotundifolia	Liana	Mdokadoka	Visual aspects of stem
C. sylvicola			
C. quinquangularis			
Bridelia micrantha	Tree	Mdudu	Visual aspects of leaves
Zanthoxylum chalybeum	Tree	Mdungu	Visual aspects of leaves, aromatic of leaves, bark and roots
Bruguiera gymnorrhiza	Tree	Mdzago	Visual aspects of leaves and stem
Catunaregam nilotica	Shrub	Mdzongodzongo	Visual aspects of leaves and fruits
Garcinia livingstonei	Shrub	Mfidzofidzo	Visual aspects of leaves and stem
Vitex payos	Tree	Mfudu	Visual aspects of leaves and taste features of fruits
Vitex mombassae	Tree	Mfudu madzi	Visual aspects of leaves and taste features of fruits
Vitex doniana	Tree	Mfudu unga	Visual aspects of leaves and taste features of fruits
Canthium kilifiensis	Shrub	Mfumula ndolwa	Visual aspects of leaves
Cynometra suaheliensis	Tree	Mfunda	Visual aspects of leaves
Schlechterina mitostemmatoides	Liana	Mfunga nyama	Visual aspects of leaves
Heinsia crinita	Shrub	Mfyofyo	Visual aspects of leaves
Sterculia rhynchocarpa	Tree	Mgoza	Visual aspects of leaves and inner bark of stem
Acacia stuhlmannii	Tree	Mgunga	Visual aspects of leaves
Lantana camara	Shrub	Mjasasa	Visual aspects of leaves, flowers and fruits
Pandanus kirkii	Shrub	Mkadi	Visual aspects of leaves and aromatic features of flowers
Flueggea virosa	Shrub	Mkambavitu	Visual aspects of leaves
Crotalaria emarginata	Herb	Mkelekele	Visual aspects of leaves
Vitellariopsis kirkii	Shrub	Mkilishangwe	Visual aspects of leaves and stem
Sideroxylon inerme	Tree	Mkoko bara	Visual aspects of leaves
Hyphaene compressa	Tree	Mkoma	Visual aspects of leaves, stem and fruits
Grewia plagiophylla	Tree	Mkone	Visual aspects of leaves
Grewia densa	Shrub	Mkone chibugu	Visual aspects of leaves
Balanites wilsoniana	Tree	Mkonga	Visual aspects of leaves
Combretum schumannii	Tree	Mkongolo	Visual aspects of leaves and stem
Ellipanthus hemandradenioides	Tree	Mkongolo mwiru	Visual aspects of leaves

Appendix V Cont.

BOTANICAL NAME	LIFE FORM	DIGO NAME	IDENTIFICATION DETAILS (human senses and plant features used)
Grevea eggelinga	Shrub	Mkota wongo	Visual aspects and aromatic features of leaves
Ziziphus mauritiana	Tree	Mkunazi	Visual aspects of leaves and fruits
Terminalia catappa	Tree	Mkungu	Visual aspects of leaves and fruits
Sorindeia madagascariensis	Tree	Mkunguma	Visual aspects of leaves and fruits
Digitaria milanjiana	Grass	Mkuse	Visual aspects of whole plant
Ficus lutea	Tree	Mkuyu	Visual aspects of leaves
Ficus sur			
Ficus sp			
Tamarindus indica	Tree	Mkpwadzu	Visual aspects and taste features of leaves and fruits
Strychnos madagascariensis	Tree	Mkpwakwa	Visual aspects of leaves and fruits
Phyllanthus reticulatus	Shrub	Mkpwamba lungo	Visual aspects of leaves
Monodora grandidieri	Tree	Mlala mwereru	Visual aspects of leaves and stem
Diospyros kabuyeana	Tree	Mlala mwiru	Visual aspects of leaves
Newtonia paucijuga	Tree	Mleha	Visual aspects of leaves
Manilkara mochisia	Tree	Mnago	Visual aspects of leaves
Solanum nigrum	Herb	Mnavu	Visual aspects and taste features of leaves
Erianthemum curvirameum	Parasite	Mnazi wa tsozi	Visual aspects of whole plant
Manilkara discolour	Tree	Mng'ambo	Visual aspects of leaves
Ziziphus robertsoniana			
Crossopteryx febrifuga	Shrub	Mng'andu	Visual aspects of leaves and stem
Brackenridgea zanguebarica			
Sclerocarya birrea	Tree	Mng'ongo	Visual aspects of leaves and fruits
Antiaris toxicaria	Tree	Mnguonguo	Visual aspects of leaves and stem
Monanthotaxis fornicata	Shrub	Mngweni madevu	Visual aspects of leaves
Uvaria acuminata	Shrub	Mngweni mchetu	Visual aspects and aromatic features of leaves
Uvaria lucida	Shrub	Mngweni mlume	Visual aspects of leaves
Trichilia emetica	Tree	Mnwa madzi	Visual aspects of leaves
Pseudobersama mossambicensis			
Cussonia zimmermannii	Tree	Mnyala	Visual aspects of leaves
Gigasiphon macrosiphon	Tree	Mnyandza	Visual aspects of leaves
Parkia filicoidea	Tree	Mnyendze	Visual aspects of leaves
Flacourtia indica	Shrub	Mnyondoya	Visual aspects of leaves and fruits
Keetia lukei	Shrub	Mnyundzu	Visual aspects of leaves and fruits
Keetia venosa			
Keetia zanzibarica			
Triumfetta rhomboidea	Herb	Mnyururika	Visual aspects of leaves
Paullinia pinnata	Liana	Mongo wa mbulu	Visual aspects of leaves

Appendix V Cont.

BOTANICAL NAME	LIFE FORM	DIGO NAME	IDENTIFICATION DETAILS (human senses and plant features used)
Markhamia zanzibarica	Tree	Mpalawanda	Visual aspects of leaves
Leptactina platyphylla	Tree	Mpera wa tsakani	Visual aspects of leaves
Vismia orientalis			
Gloriosa superba	Herb	Mpewa	Visual aspects of leaves and flowers
Achyranthes aspera	Herb	Mphulula mbuzi	Visual aspects of whole plant and fruits, and piercing (touch) feature of fruits
Acacia zanzibarica	Tree	Mpiga kululu	Visual aspects of leaves and wind sound effect
Landolphia kirkii	Liana	Mpira	Visual aspects of leaves, stem and fruits
Albizia anthelmintica	Tree	Mporojo	Visual aspects of leaves and stem
Deinbollia borbonica	Shrub	Mpwakapwaka	Visual aspects of leaves and fruits
Diospyros squarrosa	Tree	Mpweke	Visual aspects of leaves and stem
Dalbergia boehmii	Tree	Mrandze	Visual aspects of leaves, aromatic features of roots
Lecaniodiscus fraxinifolius	Tree	Mremero	Visual aspects of leaves
Sesamum calycinum	Herb	Mrenda	Visual aspects of leaves
Dioscorea dumetorum	Herb	Mriga	Visual aspects of leaves and stem
Brachystegia spiciformis	Tree	Mrihi	Visual aspects of leaves and inner bark
Paramacrolobium coeruleum			
Pluchea dioscoridis	Herb	Mrinda ziya	Visual aspects of whole plant
Commiphora edulis	Shrub	Mryakwembe	Visual aspects of leaves
Jatropha sp.	Herb	Msabuni	Visual aspects of whole plant
Drypetes natalensis	Tree	Msambwe	Visual aspects of leaves
Ozoroa insignis	Shrub	Msangasanga	Visual aspects of leaves
Ozoroa obovata			
Ficus exasperata	Tree	Msasa	Visual aspects and sandpapery features (touch) of leaves
Cordia monoica			
Ceiba pentandra	Tree	Msufi	Visual aspects of leaves, stem and fruits
Dobera loranthifolia	Tree	Msuwaki	Visual aspects of leaves
Hymenaea verrucosa	Tree	Mtandarusi	Visual aspects of leaves and ‘gum’ sap
Oncoba spinosa	Shrub	Mtondoo	Visual aspects of leaves
Calophyllum inophyllum	Tree	Mtondoro	Visual aspects of leaves
Senna occidentale	Herb	Mtsalafu	Visual aspects of leaves
Synsepalum brevipes	Tree	Mtsamvia	Visual aspects of leaves, stem and fruits
Synsepelum subverticillatum			
Albizia versicolor	Tree	Mtsani ndzovu	Visual aspects of leaves and timber
Albizia adianthifolia	Tree	Mtsani tsiye	Visual aspects of leaves and timber
Acalypha fruticosa	Shrub	Mtsatsa	Visual aspects of leaves
Grewia glandulosa	Shrub	Mtsaye	Visual aspects of leaves
Grewia vaughanii			
Piliostigma thonningii	Tree	Mtseketse	Visual aspects of leaves

Appendix V Cont.

BOTANICAL NAME	LIFE FORM	DIGO NAME	IDENTIFICATION DETAILS (human senses and plant features used)
Hoslundia opposita	Shrub	Mtserere	Visual aspects of leaves
Maytenus heterophylla	Shrub	Mtsokola wongo	Visual aspects of leaves
Rytigynia celastroides	Shrub	Mtsokolang'ongo	Visual aspects of leaves
Drypetes reticulata	Tree	Mtsomatsanje	Visual aspects of leaves
Ochna mossambicensis	Tree	Mtsometsome	Visual aspects of leaves
Ochna thomasiana	Tree	Mtsonga mahana	Visual aspects of leaves
Polysphaeria parvifolia	Shrub	Mtsonga nyomba	Visual aspects of leaves
Polysphaeria multiflora			
Croton megalocarpoides	Tree	Mtsunduzi	Visual aspects of leaves
Hibiscus micranthus	Herb	Mtsunga ng'ombe	Visual aspects of leaves
Launaea cornuta	Herb	Mtsunga wa utsungu	Visual aspects and taste features of leaves
Jasminum meyeri-johannis	Shrub	Mtunda hofu	Visual aspects of leaves and flowers
Ximenea americana	Shrub	Mtundukula	Visual aspects of leaves and fruits
Solanum incanum	Shrub	Mtungudza koma	Visual aspects of leaves and fruits
Strychnos spinosa	Tree	Muhonga	Visual aspects of leaves and fruits
Thespesia danis	Shrub	Muhowe	Visual aspects of leaves
Brachylaena huillensis	Tree	Muhuhu	Visual aspects of leaves and stem
Senna singueana	Shrub	Muhumba	Visual aspects of leaves
Ophrypetalum odoratum	Tree	Muizu wa tsakani	Visual aspects of whole plant
Julbernardia magnistipulata	Tree	Mukwe	Visual aspects of leaves
Ricinus communis	Shrub	Muono	Visual aspects of leaves and seeds
Barringtonia racemosa	Tree	Muorong'ondo	Visual aspects of leaves
Turraea floribunda	Shrub	Muoza nyama	Visual aspects of leaves
Dalbergia melanoxylon	Tree	Muphingo	Visual aspects of leaves and inner wood
Avicennia marina	Tree	Mutsu	Visual aspects of leaves and stem
Saba comorensis	Liana	Muungo	Visual aspects of leaves and fruits
Premna hildebrandtii	Shrub	Muurusa pungu	Visual aspects and aromatic features of leaves, stem and roots
Adansonia digitata	Tree	Muuyu	Visual aspects of whole plant
Millettia usaramensis	Shrub	Mvamva	Visual aspects of leaves
Vangueria infausta	Tree	Mviru	Visual aspects of leaves and fruits
Premna chrysoclada	Shrub	Mvuma	Visual aspects and aromatic features of leaves, stem and roots
Borassus aethiopum	Tree	Mvumo	Visual aspects of leaves and stem
Acalypha neptunica	Shrub	Mvundza jembe	Visual aspects of leaves
Allophylus rubifolius			
Mallotus oppositifolius			
Allophylus pervillei	Shrub	Mvundza-kondo	Visual aspects of leaves
Kigelia africana	Tree	Mvungunya	Visual aspects of leaves and fruits

Appendix V Cont.

BOTANICAL NAME	LIFE FORM	DIGO NAME	IDENTIFICATION DETAILS (human senses and plant features used)
Milicia excelsa	Tree	Mvure	Visual aspects of leaves and stem
Davallia chaerophylloides	Herb	Mvwiko	Visual aspects of leaves
Adenium obesum	Shrub	Mwadiga	Visual aspects of whole plant
Rottboellia exaltata	Grass	Mwamba nyama	Visual aspects of leaves
Bridelia cathartica	Shrub	Mwambeberu	Visual aspects of leaves and fruits
Cissus sp.	Liana	Mwamchitophyo	Visual aspects of stem
Tragia furialis	Herb	Mwamdzavi	Visual aspects and itchy features (touch) of leaves
Terminali sambesiaca	Tree	Mwanga	Visual aspects of leaves
Isolana cauliflora	Shrub	Mwanga jine	Visual aspects of leaves
Polyalthia stuhlmannii	Shrub	Mwangajine mchetu	Visual aspects of leaves and roots, and aromatic features of root
Uvariodendron kirkii	Tree	Mwangajine mlume	Visual aspects of leaves, aromatic and colour of root
Abrus precatorius	Herb	Mwangala nyuchi	Visual aspects of leaves
Bombax rhodognaphalon	Tree	Mware	Visual aspects of leaves and stem
Azadirachta indica	Tree	Mwarubaini	Visual aspects of leaves, taste of leaves, bark and roots
Inhambanella henriquesii	Tree	Mwembetsaka	Visual aspects and aromatic features of leaves
Cyphostemma adenocaule	Shrub	Mwenjere	Visual aspects of whole plant and taste of leaves
Asparagus sp.	Herb	Mwinika ndzovu	Visual aspects of whole plant
Asparagus falcatus	Herb	Mwinika ngulu	Visual aspects of whole plant
Syzygium cumini	Tree	Mzambarau	Visual aspects of leaves and fruits
Rauvolfia mombasiana	Shrub	Mzigande	Visual aspects of whole plant
Asteranthe asterias	Shrub	Mzondohera nguluwe	Visual aspects of leaves
Diphasia sp. A (of FTEA)	Tree	Nchikoma	Visual aspects of leaves
Blighia unijugata	Tree	Nchivuri	Visual aspects of leaves
Chytranthus obliquinervis	Shrub	Nchivuri mlume	Visual aspects of leaves
Mariscus spp.	Grass	Ndago lume	Visual aspects of whole plant
Kyllinga erecta	Grass	Ndago munda	Visual aspects of whole plant
Cyperus rotundus	Grass	Ndago ziya	Visual aspects of whole plant
Synaptolepis kirkii	Herb	Njira mbiri	Visual aspects of leaves and stem
Carissa bispinosa	Shrub	Nvuje ya nze	Visual aspects of leaves
Gossypioides kirkii	Shrub	Pamba mwitu	Visual aspects of leaves
Vernonia hildebrandtii	Shrub	Phatsa	Visual aspects of leaves
Corchorus olitorius	Herb	Phombo	Visual aspects of leaves
Senecio cydoniifolius	Herb	Phoza	Visual aspects of leaves
Hyptis suaveolens	Herb	Pungahewa	Visual aspects of leaves and fruits
Solanecio angulatus	Herb	Reza	Visual aspects of leaves
Bidens pilosa	Herb	Todza	Visual aspects of leaves and fruits
Heteropogon contortus			

Appendix V Cont.

BOTANICAL NAME	LIFE FORM	DIGO NAME	IDENTIFICATION DETAILS (human senses and plant features used)
Nymphoides forbesiana	Herb	Toro	Visual aspects of whole plant and flowers
Nymphaea sp.	Herb	Toro ndide	Visual aspects of whole plant
Tacca leontopetaloides	Herb	Ulanga	Visual aspects of leaves and flowers
Mucuna pruriens	Shrub	Uphupu	Visual aspects of leaves, and itchy feeling from fruits
Ficus stuhlmannii	Tree	Uuzi kaha	Visual aspects of leaves
Ocimum gratissimum	Herb	Vumbamanga	Visual aspects of whole plant

APPENDIX VI: Notes on the Digo plant naming criteria

Correspondences here refer to languages that share the vernacular plant name, abbreviated as 'di' for Digo, 'du' for Duruma, 'gi' for Giriama and 'swa' for Swahili. Information on the vernacular plant names for Duruma, Giriama and Swahili, was consulted from Beentje (1994), Heine & Legére (1995), Pakia (2000)

Botanical name	Digo name	Semantics	Correspondences
		REFERENCE TO HABITAT	
Tephrosia villosa	Chibalazi mlungu	'Pigeon pea of God', so called because it grows wild (under God's care), but resembles cultivated pigeon pea i.e. *Mbalazi* (*Cajanus cajan*)	di, du
Tephrosia villosa	Chibalazi cha nze	'Pigeon pea of outside'. It is not cultivated, thus it grows 'out' there.	-
Carissa bispinosa	Nvuje ya nze	'Nvuje of outside'. There is an Indian medicine known as *nvuje* (a spirit related medicine) that is sold in shops. This plant is considered a wild form of the same.	-
Melanthera biflora	Futswe ra pwani	'*Futswe* of the sea side'. The species is named after *Futswe* [*Asystesia gangetica*] but recognized to grow more to the sea front than the other species.	-
Guettarda speciosa	Mkungu wa pwani	'*Mkungu* of the sea side'. Species named after *Mkungu* [*Terminalia catappa*] but recognized to grow at the sea front. What is confusing is that *Mkungu* is relatively new in the area compared to the species named after it.	di, swa
Vitex zanzibarensis	Ubani wa pwani	'Incense of the sea side'. Species so called because it grows at the sea side and its exudates is used as incense (aromatic gum).	-
Triainolepis africana	Mzigande wa pwani	'*Mzigande* of the sea side'. Species considered as the sea front type of *Mzigande* [*Rauvolfia mombassiana*].	-
Pseudobersama mossambicensis Trichilia emetica	Mnwa madzi	'Water drinker'. The name refers to the species preference in growing near rivers.	-
Pluchea dioscoridis	Mrinda ziya	'Water pond protector'. The name refers to the species' common presence near water ponds.	-
Manilkara discolor Ziziphus robertsoniana	Mng'ambo	'Across the river'. The species is so called because it commonly grows at the river banks [*ng'ambo*]	-
Leptactina platyphylla	Mpera wa tsakani	'*Mpera* in the forest'. The species is recognized as the forest type of *Mpera* [*Psidium guajava*]	-
Jasminum meyeri-johannis	Muasmini wa tsakani	'*Muasmini* in the forest'. The species is recognized as the wild form of grown perfume plant - *Muasumini* [*Jasminum* sp]	-
Ophrypetalum odoratum	Muizu wa tsakani	'Banana in the forest'. The shape of the fruits of this species resembles those of *mazu* [bananas] hence the name, but recognized as the forest type.	-
Sansevieria kirkii	Konje tsaka	'Sisal in the forest'. The species resemble *konje* [sisal – *Agave sisalana*], but grows in the forest	-
Toddaliopsis sp.	Chidimu tsaka	'Small lime plant in the forest'. The species is considered as the forest form of *Mdimu* [*Citrus auratiifolia*], but also smaller [*Chi_*] compared to '*Mdimu tsaka*'.	di, gi
Hunteria zeylanica Suregada zanzibariensis	Mdimu tsaka	'Lime plant in the forest'. The species is considered as the forest form of *Mdimu* [*C. auratiifolia*]	-
Memecylon sansibaricum	Mphvamva tsaka	'Forest *Milletia*'. The species is recognized as the forest type of the *Mphamva* [*Millettia usaramensis*] which grows in bushed grassland.	-
Inhambanella henriquesii	Mwembe tsaka	'Forest Mango tree'. The species is recognized as the forest type of *Mwembe* [*Mangifera indica*].	-

Millettia usaramensis	Msumari bara	'Hinterland nail'. The wood of the species is used as wooden-nails, but is not the 'imported' nails via the sea, this comes from hinterland.	di, swa
Sideroxylon inerme	Mkoko bara	'Hinterland mangrove' The species is recognized as a *Mkoko* [mangrove] that grows hinterland.	-
Sideroxylon inerme	Mkoko mwitu	'Forest mangrove'. The species is recognized as a *Mkoko* [mangrove] type that grows in the forest.	-
Gossypioides kirkii	Pamba mwitu	'Wild cotton'. The fruit of the plant resemble those of cotton [*Gossypium* sp]. The term *mwitu* suggest the name is a loan from Swahili	di, du, swa
Dioscorea sansibariensis	Vwivwi koma	'Wild *Vwivwi*'. The species is recognized as a wild *Vwivwi*. Although not collected in this study, most likely there is a *Vwivwi* plant that is edible, hence this is distinguished as the wild and/or 'poisonous' form.	-
Solanum incanum	Mtungudza koma	'Wild tungudza'. The species is considered as a wild form (poisonous or non-edible) of the cultivated vegetable *Tungudza* [*Solanum macrocarpon*]	di, du, swa
Sideroxylon inerme	Mtunda koma	'Wild fruit'. The plant is recognized as fruiting, but its *tunda* [fruit] is considered wild (poisonous or non-edible).	di, du
Cyperus sp.	Ndago munda	'Farmland sedge' is a species of *Ndago* [sedge] that is commonly found in the *munda* [farm].	di, du, gi, swa
		REFERENCE TO EXTRACT OR EXUDATE	
Rauvolfia mombasiana	Chibombo ulimbo	'*Chibombo* with latex'. The species is considered as similar to *Tabernaemontana* spp. But has '*ulimbo*' [latex], probably emphasizing the poisonous effect of the latex in this species.	-
Ficus stuhlmannii	Chiganda ulimbo	'Ficus with latex'. Most Ficus spp. (Fig trees) have latex, but the latex in this species is emphasized for its preference in the use of sticking feathers to arrow shafts.	di, du
Lannea schweinfurthii ssp. stuhlmanii	Mnyumbu madzi	'*Mnyumbu* with water'. The species is considered similar to *Mnyumbu* [*Lannea schweinfurthii* spp. *Accutifoliolata*] but the distinction with 'water' between the two was not clear. The name *Mchumbu* is interchangeable with *Mnyumbu*.	di, du, gi, swa
Vitex mombassae	Mfudu madzi	'*Mfudu* with water'. The unmarked label *Mfudu* refers to *Vitex payos*, and this particular *V. mombassae* is recognized to have fruits that are more watery compared to the unmarked *Mfudu*.	di, du, gi, swa (for *Mfudu*)
Vitex doniana	Mfudu unga	'*Mfudu* with flour'. The fruits of *V. doniana* are considered to have more flour (starch) compared to the unmarked *Mfudu*.	di, du, gi, swa (for *Mfudu*)
		REFERENCE TO ANIMAL OR ANIMAL PART	
Acacia mellifera	Chikwata kombe	'Acacia with claws'. *Chikwata* is the general name for *Acacia* species. This is named after its prominent thorns, which are referred to as claws [*kombe*]	di, du, gi, swa (*Chikwata*)
Achyranthes aspera	Mphulula mbuzi	'Goat scratcher'. Fruits of this species, which grows about knee high (the height of a goat), tend to scratch [*phulula*] and stick to passing objects, including goats [*mbuzi*].	di-du
Hibiscus micranthus	Mtsunga ng'ombe	Cattle herder	-
Commiphora edulis	Mrya kpwembe	'Food for *kpwembe*'. Fruits are believed to be the food of *Kpwelekpwembe* (a bird), shortened here as *kpwembe*.	di, du, gi
Combretum schumannii	Mrya nyani	'Eaten by Baboon'. The 'food' relations between baboon [*nyani*] and the species was not clear	di, du, gi
Holarrhena pubescens	Muolaga kuku	'Chicken killer'. The species is considered as poisonous, kill [*olaga*] chicken [*kuku*].	-
Premna hildebrandtii	Muurusa pungu	'Scare off *pungu*'. *Pungu* is a bird believed to cause convulsions, this species scares off [*urusa*] that bird to cure the convulsions.	di, du
Pluchea sordida	Mvua koe	'Fisher of *koe*'. *Koe* is a certain crustacean in the sea, sticks of the species are used for fishing it.	-
Ochna thomasiana	Mvua pweza	'Fisher of octopus'. Sticks of this species are used to fish the octopus.	-
Albizia adianthifolia	Mtsani tsiye	'Small mtsani'. *Mtsani* is a collective name for some *Albizia* spp. This type is considered to be the small form [*tsiye*]	-
Albizia versicolor	Mtsani ndzovu	'Elephant mtsani'- is the larger size *Albizia*, named after a 'large' animal, the elephant [*ndzovu*]	di, du, gi, swa
Asparagus sp.	Mwinika ndzovu	'Elephant size *Mwinika*'. *Mwinika* a collective name for *Asparagus*, and it means to 'crouch down'. This species is considered (medicinally) as strong enough to crash an elephant.	di, du, swa
Asparagus falcatus	Mwinika ngulu	'King fish *Mwinika*'. This *Asparagus* is medicinally strong, with curative power that can crash a king fish	di, du, swa

		[*ngulu*].	
Tetracera boiviniana	Mkala fisi	'Hyena's residence' – species characterizes the residence [*makao*] of the hyena [*fiis*]	di, du, swa
Maytenus undata	Machende ga mnyau	'Testis of cat'. The fruits of this species resemble the testis [*machende*] of a cat [*mnyau*].	-
Scadoxus multiflora *Siphonochilus brachystemon*	Mnazi wa nyoka	'Coconut tree of a snake'. The *nyoka* [snake] in this label is indicative of the poisonous status of the species, which grows like a (small) coconut tree [*mnazi*m].	-
Erianthemum curvirameum	Mnazi wa tsozi	'Coconut tree of sun bird', is an epiphytic species that grows high on other plants. The sun bird likes visiting the flowers of this species, hence considered as an important plant to the sun bird as a coconut tree is to a Digo farmer.	-
Capparis viminea *Acacia adenocalyx*	Chikombe tsui	'Claws of leopard'- Thorns of this species are equated to the claws [*kombe*] of a leopard [*tsui*].	di, swa
Plectranthus sp.	Galagala tsui	'Playing site for leopard'. Probably refers to a species found in vegetation that leopards like for playing ground [*galagala*].	-
Cissampelos pareira	Chishikio paka	'Ear of a cat'. The leaves of the species resemble the ear [*shikio*] of the cat, hence the name. However, this name is probably a loan, because in Digo ear is *sikiro* and not *shikio* (which sounds more like Swahili).	di, swa
Ormocarpum sennoides	Humbo ra nguluwe	'Stomach of the pig'- the stem of this species twines like the stomach [*humbo*] of the pig [*nguluwe*]	di, du, gi, swa
Cordia monoica *Asteranthe asterias*	Mzondohera nguluwe	'Wiper of pig's buttocks'. The pig is believed to clean its buttocks [*zondoha*] after toileting with this species.	-
Paullinia pinnata	Mongo wa mbulu	'Backbone of the crocodile'. The leaf of the species resembles the backbone [*mongo*] of the crocodile [*mbulu*], hence its name.	-
Alchornea laxiflora	Chiphala kanga	'? of *kanga*'. *Kanga* refers to the guinea fowl. But the meaning of *Chiphala* is unknown.	-
Antidesma venosum	Mdanga tsongo	'Settling place for weaver bird' – the species is known as a preferred resting place for weaver birds.	di, du
Clausena anisata *Phyllanthus delpyanus*	Chinya pala	Meaning Unknown. *Pala* means gazelle, but the meaning of '*chinya*' is only suspected to be faeces, and there is no clear link between this meaning and the species.	di, du
Rinorea ilicifolia	Mwambala lutswa	'Termite crawler' – the species is used for building, and is known to be favoured by termite [*lutswa*] that build and crawl [*hambala*] along the poles.	-
Abrus precatorius	Mwangala nyuchi	Meaning Unknown. *Nyuchi* refers to bees, but the meaning of the first part of the name is unknown.	-
Aganthesanthemum bojeri	Chivuma nyuchi	'Buzzing bees'. In its flowering stage the bees frequently visit the species, hence its name.	-
Xylopia parviflora	Mngwa nyahi	'Fallen buffalo'. Probably the species was a land mark for a place where a buffalo [*nyahi*] had fallen [*gwa*] after it was arrowed. But it is not clear how else the species relate to the buffalo.	-
Hoslundia opposita	Mgongolo	'Millipedes' The relationship between the species and the millipede is not clear.	di, du
Senna occidentalis	Mtsalafu	'Safari ants'- the relationship between the species and safari ants is not clear.	-
Stylosanthes fruticosa	Mtsungula	'Rabbit' – species is named after rabbit [*tsungula*], but the association of the two is not clear.	-
		MALE-FEMALE REFERENCE	
Elaeodendron schweinfurthianum	Chikunguni chilume	'*Chikunguni* male' - The species is considered as the male form of *Chikunguni* [*Craibia brevicaudata*]. Although the word *kunguni* means bedbug the relationship between these species and the bedbug is not clear. Neither is the male state of this species over *C. brevicaudata*.	-
Rhynchosia velutina	Chibugu chichetu	'Female climber'- *Chibugu* is the diminutive label for climber [*Mbugu*], and this species is considered the female form, thus it also takes the unmarked label *Chibugu* (cf. below).	-
Indigofera trita	Chibugu chilume	'Male climber' - This is the male form of *Rhynchosia velutina*, but reasons for it being the male are not clear.	-
Lantana viburnoides	Chiphatsa chilume	'*Chiphatsa* male'- *Chiphatsa* or *Phatsa* refers to *Vernonia hildebrandtii*. So called because it covers the ground like a roofing structure [*kuphatsa*]. The *L. viburnoides* is viewed as the male form of the unmarked *Chiphatsa*.	-
Pupalia lappacea	Jirimata chetu	'*Jirimata* female' - *Jirimata* is like a 'genus' category of thorny fruit producing plants. The *P. lappacea* is considered female because its fruits are not very sharp	di, du, swa

Cenchrus mitis	Jirimata lume	'*Jirimata* male' – the fruits are more sharp and fierce.	-
Commelina bracteosa	Kongwe chetu	'*Kongwe* female' - this species is considered the female form because it has large and deep blue flowers compared to the male counter part, *C. forskaolii*	di, swa
Commelina forskaolii	Kongwe lume	'*Kongwe* male' – is the male form because of smaller and less shiny (grayish) flowers (comparative to the female counter part *C. bracteosa*).	_
Cyphostema adenocaule	Mgongolo mlume	'*Mgongolo* male' – the species is considered as the male form of *Hoslundia opposita* [*Mgongolo*], however the relationship with the *gongolo* [millipede] for both species is not clear.	-
Oncoba spinosa	Mnyondoya mchetu	'*Mnyondoya* female' - The unmarked *Mnyondoya* [*Flacourtia indica*] resembles this species in the presence of thorns. It is surprising that the female form is marked.	-
Polyalthia stuhlmannii	Mwangajine mchetu	'Female spirit-being' - This species also identified with the unmarked *Mwangajine* is considered female, probably for having smaller leaves compared to the other *Mwangajine*.	-
Uvariodendron kirkii	Mwangajine mlume	'Male spirit-being' – similar in appearance (both being Annonaceae species), this species is identified as the male form due to its large leaf size.	di, du
Chytranthus obliquinervis	Nchivuri mlume	'*Nchivuri* male' – the species is considered the male form of *Blighia unijugata* but their gender considerations are not clear.	-
Cyperus spp.	Ndago chetu	'Female sedge' - *Ndago* refers to sedges. This is considered as female because it has a relatively longer spikelets compared to the male counter part, *Mariscus* spp.	di, du, gi, swa (*Ndago*)
Mariscus spp.	Ndago lume	'Male sedge' – considered as male because it has an inflorescence that has relatively shorter spikelets compared to *Cyperus* spp.	di, du, swa (*Ndago*)
Monanthotaxis fornicata	Mngweni mlume	'*Mgweni* male' - *Mgweni* refers to some *Uvaria* spp. This is considered as male because it has broad leaves compared to the female counter part	-
Uvaria acuminata	Mngwene mchetu	'*Mgweni* female' – so called because it has smaller leaves	-
Flueggea virosa	Mkpwamba mchetu	'*Mkpwamba* female' - this species produces more visible white fruits, hence considered female form.	di, du, gi, swa (*Mkpwamba*)
Flueggea virosa	Mkpwamba vitu	'Productive *Mkpwamba*'. *Vitu* in this name refer to the fruits, and have the connotation of 'female' form as above.	di, du, gi, swa (*Mkpwamba*)
Phyllanthus reticulatus	Mkpwamba lungo	'Basket *Mkpwamba*' – this is considered as the male counter part of *F. virosa*, but the association with the basket [*lungo*] is unclear.	di, du
		COLOUR REFERENCE	
Ellipanthus hemandradenioides	Mkongolo mwiru	'Black *Mkongolo*'. The unmarked *Mkongolo* [*Combretum schumannii*] has a brownish bark that peels off to reveal a paler under bark, which is compared to the bark of this species, that is described as black [*mwiru*].	-
Combretum paniculatum	Mkongolo wakundu	'Red *Mkongolo*' – this is the red form of *Mkongolo*. The 'red' *Mkongolo* is a climber, and is compared with the unmarked *Mkongolo* (a tree) via the colour of the flowers. Red *Mkongolo* has deep red flowers. Although consideration of tree and climber as related is not common, this is shared with science as bothe species are of the genus *Combretum*.	-
Monodora grandidieri	Mlala mwereru	'White *Mlala*'. *Mlala* is a label for two species distinguished by the colour of the bark of their stem. This species is considered the white form comparative to the other (cf. below).	di, du, gi (*Mkwele*)
Diospyros kabuyeana	Mlala mwiru	'Black *Mlala*' is the black form of *Mlala* because its bark is comparatively darker.	-
Maclura africana	Mdhahabu	'Golden' This species has a stem that is golden yellow in colour, hence its name.	-
		SIZE REFERENCE	
Uvaria acuminata	Mngweni mdide	'Small *Mgweni*' – in addition to being the female, *U. acuminata* is also recognized as a small [*mdide*] *Mgweni* for its small leaves.	-
Uvaria lucida	Mngweni mkulu	'Large *Mgweni*' – the male *Uvaria* has the synonym as the large [*mkulu*] *Mgweni*.	-
Premna resinosa	Mbavubavu mdide	'Small rib plant' – The species is referred to as small in comparison to *Grewia forbesii* by the size of their leaves. Their 'rib' relationship is based on their use to treat convulsions known as *Nyuni wa mbavu*	-

		[convulsions affecting the rib cage].	
Grewia forbesii	Mbavubavu mkulu	'Large rib plant' is the larger form of the species used to treat *Nyuni wa mbavuni*, because it has larger leaves.	di, du, gi
Nymphaea sp.	Toro ndide	'Small *Toro*' – *Toro* refers to the water lily, and this species has relatively smaller features (leaves and flowers) compared to *Nyphoides forbesiana*, which is the unmarked *Toro*.	-
Dioscorea sp.	Mriga yere	'False *Mriga*' – refers to a form closely resembling the genuine edible *Dioscrea dumetorum*.	-
		REFERENCE TO TASTE OR SMELL	
Launaea cornuta	Mtsunga wa utsungu	'Bitter vegetable' – the species is used as a vegetable [*mtsunga*], but is known to be bitter [*utsungu*].	di, du, gi
Phyllanthus amarus	Chihumbo utsungu	'Gall bladder' – the species is named after the gall bladder [*chihumbo ustungu*] because of its bitter taste.	-
Acokanthera sp. nr *schimperi*	Utsungu	'Bitter' – this species produces an extract that is bitter [*utsungu*] and poisonous	di, gi
Terminalia catappa	Mkungu	'Good smell' – the fruit of this species has a good aroma [*kungu*] hence its name	di, swa
Clerodendrum incisum	Chinuka	'Smell' – the species is named after its strong smell [*nuka*] which agrees with even the botanical epithetic name '*incisum*'.	-
Clerodendrum glabrum	Mnuka lovu	'Bad smell' – the species is named after its smell [*nuka*] which is not pleasing [*lovu*]	-
Clerodendrum glabrum	Chinuka cha m'masai	'Masai smelling plant' – refers to the 'bad smell' which is associated with the smell of the Masai, probably ignited by the belief that the Masai are 'not good' being Digo enemies in historical fights	-
Grevea eggelinga	Mkota wongo	'Smacking the brain' – The leaves of this species have a strong smell that smacks [*kota*] the brain [*wongo*], hence the name.	-
		REFERENCE TO GROWTH FORM OR HABIT OF PLANT	
Pemphis acidula	Muinamia bahari	'Leaning towards the sea'- the species is named after its leaning habit, but the term '*bahari*' is Swahili, and it is likely that the name is a loan.	-
Monanthotaxis fornicata	Mngweni madevu	'Hairy *Mgweni*' – This species is associated to *U. acuminata* and *U. lucida* i.e. *Mgweni*, but viewed as being hairy, a view that does not agree with Beentje (1994).	-
Scorodophloeus fischeri	Chifunga sandzu	'Closing pile' – The species is understood to grow in a form of a thicket that closes [*funga*] the way by pilling [*sandzu*]. It is smaller '*Chi_*' comparative to *Mfunga sandzu* (see below)	-
Garcinia livingstonei	Mfunga sandzu	'Closing pile' – this is the unmarked form of the species that grows to close down the passage.	di, du, gi
Grewia ectasicarpa, G. holstii	Msokoto	'Twine' – the species grows in a twining form [*sokota*]	di, swa
Xylopia parviflora *Celtis mildbraedii*	Mchiza tsaka	'Over-grows forest' – species grows tallest in a forest.	-
Xylopia parviflora	Mwahula tsaka	'Forest breaker' – *X. parviflora* is also described as the forest breaker by overgrowing the canopy.	-
Schlechterina mitostemmatoides	Mfunga nyama	'Ties animal' – the plant is said to grow in twining condition that it ties [*funga*] an animal [*nyama*]crossing through it.	-
Rottboellia exaltata	Mwamba nyama	'Animal trapper' – the species grows so densely that it traps an animal crossing through.	-
Whitfieldia elongata	Mkula usiku	'Grow by night' – the species is believed to grow [*kula*] at night [*usiku*].	-
Drypetes reticulata	Mtsoma tsanje	'Bloom in new field'- species is believed to bloom [*tsoma*] very quickly in a new field [*tsanje*]	-
Deinbollia borbonica	Mtsungurira kuzimu	'Peeping heaven' – the species is deep rooted such that its believed to be peeping heaven [*tsungurira kuzimu*], here heaven being underground (because that is where the dead go)	-
Phyllanthus amarus	Mvyarira nyuma	'Producing from behind' – species produces [*vyala*] its fruits at the back [*nyuma*] of the leaves.	-
Synaptolepis kirkii	Njira mbiri	'Two ways' – the species branches twice [*mbiri*] at each point, the branches are the *njira* [ways].	-
Angraecum dives *Ansellia africana*	Chiahira	'Sitting on' – this is an epiphyte species, which is described and labeled as sitting on others [*ahira*], a term that is used for a hen when sitting on its eggs. *Chi_* is diminutive in terms of the plant size being usually small.	-
Hypoestes aristata	Jirimata futswe	This species takes the form of '*Jirimata*' [*Cenchris mitis*] but has no thorny fruits and thus resembles *Futswe* [*Asystesia gangetica*]	-

Vernonia hildebrandtii	Chiphatsa	'Covering' – species so called because it grows in a way that it covers the ground like a roofing structure [*kuphatsa*]. *Chi_* is diminutive, but it seems it is interchangeable with the unmarked label (see below)	di, swa
Vernonia hildebrandtii	Phatsa	'Covering' - species so called because it grows in a way that it covers the ground like a roofing structure [*kuphatsa*].	di, swa
Oxygonum sinuatum	Chindiri	'Tough' – *Ndiri* refers to 'tough' meat, this species probably received its name for being a 'tough' weed to deal with	-
Plectranthus flaccidus	Fuka	'To smoke up' – so called because of the rapid appearance, like smoke, of its flowers	-
Antiaris toxicaria	Mgua	'Peeling' – the bark peels off [*guwika*], hence the name	-
Cussonia zimmermannii	Mnyala	'Drying' – the species dries [*nyala*] very quickly when cut, hence its name.	di, du, gi
Xylopia parviflora	Mnyinyi	'Shining' – the leaves of this species are shinning [*nyinyiha*] hence its label.	-
Waltheria indica *Triumfetta rhomboidea*	Mnyururika	'Slippery extract' – leaves of this species are squashed and used as medicine. But the leaves on crushing produce a slippery [*nyururika*] extract, hence its name	-
Margaritaria discoidea	Mpalika	'Cracks' – the wood is said to crack [*palika*] easily, and thus its name.	-
Trema orientalis	Mpesi	'Quick' – grows very fast [*upesi*] hence its name.	-
Lecaniodiscus fraxinifolius	Mremero	'Heavy' – the wood is said to be heavy [*remera*] hence the name.	-
Blighia unijugata	Nchivuri	'Shade' – species has a broad canopy and forms a good shade [*chivurivuri*] hence its name.	-
Barleria setigera	Chidungadunga	'Piercing' – the species has thorns that pierce [*dunga*] dangerously, hence its name.	-
Cissampelos pareira	Chihumbohumbo	'Intestine' – the species grows twining like intestines [*humbo*] hence its name.	-
Euphorbia hirta	Chiziyaziya	'Milk' – the species produces milk latex [*maziya*]. *Chi_* is diminutive to the unmarked form, (see below).	-
Hunteria zeylanica *Sideroxylon inerme*	Mziyaziya	'Milk' – species is the unmarked form of the latex producing plants	di, du,
Psychotria lauracea	Mbogaboga	'Vegetable' – grows like a vgetable [*boga*] hence its name	-
Parquetina nigrescens	Libugu pamba	'Climbing cotton' – species has a climber form [*_bugu*] and produces woolly fruits [*pamba*].	-
Grewia densa	Mkone chibugu	Climber 'mkone' – species has a climber form, but resembles *Mkone* [*Grewia plagiophylla*].	di, du
Rhynchosia velutina	Chibugu	'Climber' – species is a diminutive [*Chi_*] form climber *_bugu*.	-
Plicosepalus parviflorus	Chisikolo	'No stem' – the name is a short form of *Chibugu sicho kolo* – referring to a climber [*chibugu*] that has no stem base [*kolo*] (see below).	-
Pleicosepalus parviflorus	Chibugu sicho kolo	'Climber without stem base' – the species is believed it grows without a stem base or rooting system.	-
Cissus rotundifolia, C. sylvicola *C. quinquangularis*	Mbugubugu	'Climber' – this is the unmarked form of climber species, reduplication *_bugubugu* emphasizes the 'climber form'	di, du, gi
Cissus rotundifolia, C. sylvicola *C. quinquangularis*	Mdokadoka	'Breaking' – the stem of the species is known to break [*doka*] easily, hence its name.	-
Tylophora sp.	Dokadoka	'Breaking' - the stem of the species is known to break [*doka*] easily, hence its name. Exclusion of 'M' does not seem to change meaning, and it was not expected to refer to a different species	-
Flueggea virosa *Phyllanthus reticulatus*	Mkambakamba	'Rope' – species is a scandent and grows twining like a rope [*kamba*] hence its name.	di, du, gi, swa (for *Mkamba*)
Pseudovigna argentea	Yogweyogwe	'Sweet potato' – by the nature of its growth (spreading) this species is compared to sweet potato [*Ipomoea batatas*], i.e. *myogwe*. The reduplication indicates 'in the manner of'.	-
Ampelocissus africana	Mbebeneka	'Chewable' – the stem of the species is chewable (*bebeneka*], hence its name.	-
Stylochaeton salaamicus	Chikonje	'Sisal' – the species resembles sisal [*Sisalana agave*] (*konje*), and its small size is indicated with the diminutive label *Chi_*.	-
		RFERENCE TO UTILITY	
Isolana cauliflora	Mwanga jine	Spirit-being – *Mwanga* and *Jine* are both spirits names. The species is named after dual spirits for its importance as a medicine in spiritual ailments.	-

Adansonia digitata	Mkulu kazingwa	'The great is never betrayed' – This is a 'healers' name for the species, one of the few the author was allowed to record. It refers to the baobab, a large tree [*mkulu*] that when used as medicine it never fails.	-
Fernandoa magnifica	Mlangalanga zuka	'Whip of sacred powers' – a stick of the species is used as a whip [*mlanga*] to punish offenders or to open magically (by whipping) places that are closed e.g. homes and graves	-
Carpodiptera africana	Mlanga	'Whip' – branches of the species are used as magical whips against enemies	-
Pleurostelma cernuum	Mlaza koma	'Layer of spirits' – the species is named after its use of appeasing the spirits [*koma*] of dead relatives and put them to sleep [*laza*] in peace	-
Boerhavia repens	Mtsimbi kaya	'Home digger' – The species is used to magically destroy peace in a homestead [*kaya*] by 'digging out' [*tsimba*] (meanint to initiate) internal disputes.	-
Aganthesanthemum bojeri	Chivuundza kesi	'Case terminator' – the species is used to end [*vundza*] a dispute in favour of the user.	di, du, gi, swa
Acalypha neptunica *Alchornea laxiflora* *Allophylus rubifolius* *Bourreria teitensis* *Grandidiera boivinii* *Mallotus oppositifolius* *Mildbraedia carpinifolia*	Mvundza jembe	'Hoe breaker' – the species is also involved in ending [*vundza*] of disputes, and the hand hoe [*jembe*] is used as a symbolic item in the rites of solving domestic and community disputes. Literally, the name could also be cautioning a farmer about the stumps of the species which could damage one's hand hoe.	di, du
Allophylus rubifolius *Allophylus pervillei*	Mvundza kondo	'Breaker of war' – the species is used to fight and end [*vundza*] the war [*kondo*] with diseases in the body	di, du, gi, swa
Hyptis suaveolens	Pungahewa	'Spirits' – the species is used as a spiritual medicine for a specific spirit known as *punga hewa*.	-
Leucas sp.	Chimvuno	'Stomach full' – the presence of the species is an indicator that crop will do well, hence there will be food satisfaction [*mvuno*].	-
Gardenia volkensii	Chimwemwe	'Smile' – the species is magically used to induce appreciation and smile [*chimwemwe*] to an individual from peer groups and workmates	di, du
Ormocarpum kirkii	Chitadzi	'Crown of honour' – the species is magically used to crown [*tadzi*] one to dominance	di, du, gi, swa
Euphorbia nyikae	Ganga	'Healing' – the species is used for healing [*uganga*] various ailments.	di, du
Jateorhiza palmata	Kalumwa	'Never fall sick' –the species is used as a medicine for various ailments, and is considered to be so effective that the user never falls sick again [*kalumwa*]	di, swa
Sida acuta	Mbundugo	'Spiritual strength' – *Bundugo* is supplementary strength magically added to an individual, and this species is used for that.	-
Caesalpinia bonduc	Mburuga	'Foretell' – fruits of this species are used to predict and foretell [*mburuga*] events that will befall individuals and communities.	di, du, gi, swa
Dichrostachys cinerea	Mpingwa	'Opposition' – the species is considered to oppose [*pinga*] the effects of diseases.	-
Ocimum gratissimum	Chirahani	'Spirit' – the species is used to treat ailments associated with the spirit *ruhani*	-
Commiphora zanzibarica	Mdege	'Evil eye' – *Dege* is an ailment caused by one casting evil looks on another. This species is used against such an infliction.	-
Piliostigma thonningii	Mtseketse	'Tinkle' – the species is used to cause an amusement [*tseka*] in one by being successful or appreciated in an institute.	di, du, gi, swa
Hoslundia opposita	Mtserere	'Bring down' – the species used to calm down [*tserera*] disagreements between lovers.	di, gi, swa
Plectranthus tenuiflorus	Mvuga	'Mixer' – species is used in a mixture [*vuga*] of medicine against stomachache.	-
Terminali sambesiaca	Mwanga	'Spirit' – *Mwanga* is a spirit and this species is used to treat ailments caused by that spirit.	di, du, gi, swa
Premna chrysoclada	Mvuma	'Roar' – the species is used against convulsions and other spiritual ailments, and to roar [*vuma*] is a show of dominance and success in fight.	di, du, gi, swa
Azadirachta indica	Mwarubaini	'Forty' – the species is a common medicinal plant believed to treat forty [*arubaini*] diseases.	di, du, gi, swa
Senecio cydoniifolius	Phoza	'Heal' – the species is a common medicine in healing [*phoza*] spiritual ailments	-

Solanecio angulatus	Reza	'Neutralizer' – the species is used to neutralize [*reza*] witchcraft effects	-
Grewia forbesii, G. holstii	Mbavubavu	'Rib' – the species is used to treat *nyuni wa mbavuni* [convulsions affecting the rib cage].	di, du, gi
G. ectasicarpa,			
Catunaregam nilotica	Mdzongodzongo	'Stomach ailment' – *Dzongo* is commonly a stomach ailment that is inflicted by evil looks. This species is used to treat such ailment.	di, du
Secamone retusa	Chiburu madzi	'Water Gourd'. The species probably produces gourds that are used for keeping or carrying water. This still remains to be confirmed.	-
Garcinia livingstonei	Mfidzofidzo	'Stir stick' – a three pronged branch of this species is used as a stirring cooking stick [*lifidzo*].	di, du, gi
Diospyros squarrosa	Mutsi	'Pestle' – a branch of this species is used for making a pestle [*mutsi*]	-
Dobera loranthifolia	Msuwaki	'Toothbrush' – sticks of this species are used as toothbrushes.	di, du, gi, swa
Salvadora persica			
Markhamia zanzibarica	Mpalawanda	'Swahili sandals' – wood pieces of the species are used for making *mitawanda*, Swahili sandals.	di, du, swa
Landolphia kirkii	Mpira	'Rubber' – species was marketed for its latex which was used for making rubber [*mpira*]	di, swa
Kigelia africana	Mratina	'Traditional brew' – fruits of this species are used for fermenting a Kikuyu traditional brew [*mratina*], probably to the Digo this is a loan word.	-
Jatropha sp.	Msabuni	'Soap' – fruits of the species are used as alternative for detergents [*sabuni*]	di, du
Ficus exasperata	Msasa	'Sand paper' – the leaves are used as sand paper [*msasa*] to smoothen carvings	di, swa
Streblus usambarensis	Msusu	'Trap' – sticks of the species are used for making a trap [*susu*]	di, swa
Davallia chaerophylloides	Mvwiko	'Floaters' – leaves of this species are inserted in a water bucket as floaters [*mivwiko*] to minimize water spilling on to the person carrying the bucket on her head	-
Rourea orientalis	Chikuta manena	'Clears the dew' – branches of this species are used to hit [*kuta*] the grass in order to clear off the dew [*manena*] during morning errands	-
Rytigynia celastroides	Mtsokola ng'ongo	'Extractor of *Sclerocarya* fruit' – the *Sclerocarya birrea* fruits have a nut [*ng'ongo*] in the middle, and thorns of this species are used to extract [*tsokola*] the nut.	-
Maytenus heterophylla	Mtsokola wongo	'Extractor of brain' – thorns used to extract [*tsokola*] the brain stuff [*wongo*] in the skull of a prey animal e.g. gazelle.	-
Ochna thomasiana	Mtsonga mahana	'Causer of leprosy' – if the species is used for firewood or building it causes [*tsonga*] leprosy [*mahana*].	-
Turraea nilotica	Mtsonga mwiko	'Make cooking stick' – branches of the species are used for making [*tsonga*] cooking sticks [*mwiko*]	-
Dichapetalum zenkeri	Mtsonga nyomba	'Make arrow shaft' – sticks of this species are used for making [*tsonga*] arrow shafts [*nyomba*]	-
Polysphaeria parvifolia			
Polysphaeria multiflora			
Mildbraedia carpinifolia			
Abutilon zanzibaricum;	Mtsusa tsalu	'Cleaning beads' – leaves of this plant are used for cleaning [*tsusa*] beads [*tsalu*]	-
Waltheria indica;			
Triumfetta rhomboidea			
Erythrina sacleuxii	Mbamba ngoma	'Drum making' – the stem of the species is used for making [*phamba*] a drum [*ngoma*] trunk	di, swa
Erythrina sacleuxii	Mwamba ngoma	'Drum making' – same as above.	di, swa
Abutilon zanzibaricum	Mbangula mavi	'Clear human waste' – leaves of the species are used as toilet paper to clean [*bangula*] oneself of the waste [*mavi*]	di, du
Turraea floribunda	Muoza nyama	'Makes the animal rot' – the species is used for making traps. The traps are believed to be strong that animal prey [*nyama*] will rot [*ola, oza*] when caught unless the hunter collects it. In other words the animal can not break off from the trap	-
Deinbollia borbonica	Mpwakapwaka	The name of the species mimics the spitting 'sound' after one sucks the fruits which are edible. However, this is only true for *D. borbonica* , but not for *C. obliquinervis*, which probably is named after *D. borbonica* on structural resemblance bases.	-
Chytranthus obliquinervis			

Ximenia americana ssp. *caffra*	Mtundu kula	'Eat fruit' – the species fruits [*tunda*] are edible [*kula*]. However, *kula* is a Swahili word whose counter part in Digo is *rya* [eat]. There are indications that the name is a loan word from Swahili who also call it by the same name (Beentje 1994).	di, du, gi, swa
Ficus stuhlmannii	Uuzi kaha	'Thread support' – although both words have clear meanings in Digo, the connotations of these words in the plant label are not clear.	-
Mkilua fragrans	Chilua	'Flower' – the species is used for its flower, which is referred by the common Bantu label '*lua*' [flower] for perfume and ornamentation.	-
Antiaris toxicaria	Mnguonguo	'Clothing' – the bark of the species is used for making clothes [*nguo*], (but not in current times)	-
Bourreria nemoralis	Mbunduchi	'Gun' – fruits of the species are used (by children) as 'bullets' in toy guns [*bunduchi*].	di, du, swa
Striga asiatica	Chitsai	'Witch' – species is believed to be a witch [*mtsai*] against crop plants such as maize. Its small size led to the diminutive label *Chi_*.	-
Cordia goetzei	Mpamapama	'Nose wounds' – when used as firewood its smoke causes nose wounds [*pamapama*].	-
Synadenium pereskiifolium	Chiyuyu	'Peel off' – the latex from the species burns and skin peels off [*yuka*] on contact.	di, swa
Canthium kilifiensis	Mfumula ndolwa	'Dispersion of homestead' – when used as firewood or building poles, the species leads to quarrels and eventually members of the homestead [*ndolwa*] disperse [*fumuka*]. However, in Digo *ndolwa* for 'homestead' is not a common word.	di, gi
Ocimum suave	Chivumbani	'*Vumba*' – the species' has spiritual uses in healing which probably originated from Vumba in Tanzania. The species being small sized it is labeled with the diminutive prefix.	-
Ocimum gratissimum	Vumba manga	'*Vumba* cassava' – the spiritual uses of this species also likely to have been learnt from Vumba. The species has the unmarked form, but the reference to *manga* (which generally means cassava) in the labe is not clear.	-

UNANALYSABLE NAMES (The important point in the follwing names in the considerable correspondences for the vernacular names)

Vepris lanceolata	Mkumba mbega	-
Nymphoides forbesiana	Toro	-
Hypoestes forskaolei	Chibaruti	-
Craibia brevicaudata	Chikunguni	-
Ludia mauritiana		
Acalypha fruticosa	Chitsatsa	di, du, gi, swa
Ehretia bakeri	Funga	-
Asystasia gangetica	Futswe	-
Bridelia micrantha	Mdudu	-
Clerodendrum glabrum	Mtsatsa	di, du, gi, swa
Acalypha fruticosa		
Borassus aethiopum	Mvumo	-
Jasminum meyeri-johannis	Mtunda hofu	-
Tricalysia ovalifolia	Mmangi tovu	di, du
Melanthera biflora	Nchidoka	-
Dichapetalum arenarium	Chikwalakwala	-
Biophytum petersianum	Mbodzembodze	di, du
Feretia apodanthera	Mfyofyo	di, du
Heinsia crinita		
Bridelia cathartica	Mkalakala	di, du, gi, swa

Crotalaria emarginata	Mkelekele	-
Strychnos madagascariensis	Mkpwakpwa	di, du, gi, swa
Hyphaene compressa	Mlala	di, du, gi
H. corriaceae		
Tricalysia ovalifolia	Mmangwimangwi	di-du
Ozoroa insignis, O. obovata	Msangasanga	di-du
Ochna mossambicensis	Mtsometsome	-
Vernonia colorata	Mtsungutsungu	-
Sideroxylon inerme	Myongoyongo	-
Pyrenacantha kaurabassana	Bundi	-
Commiphora lindensis	Chibambara	di, du, swa
Tabernaemontana elegans	Chibombo	-
Harrisonia abyssinica	Chidori	-
Erythroxylum emarginatum	Chifumae	-
Chazaliella abrupta	Chigamba	-
Cynometra webberi	Chikwadzu	-
Phyllanthus reticulatus	Chikwamba	di, du
Vitellariopsis kirkii	Chilishangwe	di, du, swa
Eleusine indica	Chimbikaya	-
Stylochaeton salaamicus	Chinyaa	-
Acacia adenocalyx	Chinyakore	-
Scutia myrtina	Chinyokola	-
Memecylon amaniense	Chitambuu	-
Cola minor	Chitsamvia	-
Encephalartos hildebrandtii	Chitsapu	di, du, gi, swa
Cordia somaliensis	Chitundo	-
Psilotrichum sericeum	Demu	-
Commelina bracteosa	Dzedza	di, du, swa
Aloe sp.	Golonje	di, du, gi
Adenia gummifera	Gore	di, du, gi
Gonatopus boivinii	Kundzwi	di, du, gi
Indigofera sp.	Lihago	-
Panicum maximum	M'bondo	di, du, gi
Dioscorea astericus	Mani	-
Cajanus cajan	Mbalazi	di, du, gi, swa
Afzelia quanzensis	Mbambakofi	di, du, gi, swa
Commiphora lindensis	Mbambara	di, du, swa
Caesalpinia bonduc	Mbate	-
Ancylobotrys petersiana	Mbohoya	-
Annona senegalensis	Mbokwe	-

Saba comorensis	Mbungo	-
Dichrostachys cinerea	Mchinjiri	di, du, gi, swa
Hyparrhenia sp.	Mchuchi	-
Lannea schweinfurthii ssp. stuhlmannii	Mchumbu	di, du, gi, swa
Gyrocarpus americanus	Mchusa	-
Hyparrhenia sp.	Mdembe	-
Citrus auratiifolia	Mdimu	di, du, gi, swa
Salacia madagascariensis	Mdoma,	-
Synsepalum kassneri	Mdulu	-
Zanthoxylum chalybeum	Mdungu	di, du, gi
Bruguiera gymnorrhiza	Mdzago	-
Vitex payos, V. doniana, V. mombassae	Mfudu	di, du, gi, swa
Cynometra suaheliensis	Mfunda	di, du, gi
Stereospermum kunthianum	Mgondo	-
Sterculia rhynchocarpa	Mgoza	di, du, gi
Acacia stuhlmannii	Mgunga	di, du, gi, swa
Mkilua fragrans	Mgwadi	-
Zanthoxylum chalybeum	Mjafari	di, swa
Lantana camara	Mjasasa	di, swa
Pandanus kirkii	Mkadi	di, swa
Monodora grandidieri	Mkele	di, du, gi
Rinorea elliptica	Mkete	-
Bruguiera gymnorrhiza	Mkoko	di, du, gi, swa
Avicennia marina		
Hyphaene compressa, H. corriaceae	Mkoma	di, du, gi, swa
Grewia plagiophylla	Mkone	di, du, gi, swa
Balanites wilsoniana	Mkonga	di, du, swa
Combretum schumannii	Mkongolo	di, du, gi
Rhoicissus revoilii	Mkororoi	-
Ziziphus mauritiana	Mkunazi	di, du, gi, swa
Sorindeia madagascariensis	Mkunguma	-
Digitaria milanjiana	Mkuse	-
Ficus lutea, F. sur	Mkuyu	di, swa
Tamarindus indica	Mkpwadzu	di, du, gi, swa
Phyllanthus reticulatus	Mkpwamba	di, du
Monodora grandidieri	Mkwele	di, du, gi
Newtonia paucijuga	Mleha	-
Tricalysia ovalifolia	Mmangwi	di, du, gi

Polysphaeria multiflora		
Manilkara mochisia	Mnago	di, du, gi, swa
Cola ululoma	Mnapu	-
Solanum nigrum	Mnavu	di, du, gi
Gossypioides kirkii	Mngagamwe	-
Brackenridgea zanguebarica	Mng'andu	-
Crossopteryx febrifuga		
Sclerocarya birrea	Mng'ongo	di, du, swa
Gigasiphon macrosiphon	Mnyandza	-
Parkia filicoidea	Mnyendze	di, swa
Flacourtia indica	Mnyondoya	-
Stenotaphrum dimidiatum	Mnyumbwe	-
Keetia lukei, K. venosa,	Mnyundzu	-
K. zanzibarica		
Gloriosa superba	Mpewa	-
Albizia anthelmintica	Mporojo	di, du, gi, swa
Schizozygia coffaeoides	Mpukuse	-
Diospyros squarrosa	Mpweke	di, du, gi, swa
Dalbergia boehmii	Mrandze	di, du
Sesamum calycinum	Mrenda	-
Dioscorea dumetorum	Mriga	di, du, gi, swa
Brachystegia spiciformis	Mrihi	di, du, gi, swa
Paramacrolobium coeruleum		
Drypetes natalensis	Msambwe	-
Diospyros ferrea	Mshipa	-
Lantana camara	Mshomoro	di, du, gi
Ceiba pentandra	Msufi	di, du, gi
Colubrina asiatica	Msuko	-
Hymenaea verrucosa	Mtandarusi	-
Catunaregam nilotica	Mtengedzi	di, du, gi, swa
Caesalpinia bonduc	Mtera	-
Dichapetalum madagascariense	Mtobwe	-
Oncoba spinosa	Mtondoo	-
Calophyllum inophyllum	Mtondoro	di, swa
Synsepalum brevipes	Mtsamvia	-
Synsepelum subverticillatum		
Grewia glandulosa	Mtsaye	-
Grewia vaughanii		
Toddalia asiatica	Mtseha	-
Elaeis guineensis	Mtsikitsi	-
Agelaea pentagyna	Mtsophe	-

Adenia kirkii	Mtsotsone	-
Croton megalocarpoides	Mtsunduzi	-
Strychnos spinosa	Muhonga	-
Thespesia danis	Muhowe	di, du, gi, swa
Brachylaena huillensis	Muhuhu	di, du, gi, swa
Senna singueana	Muhumba	di, du, gi
Paramacrolobium coeruleum	Mukwe	di, du, swa
Julbernardia magnistipulata		
Plectranthus tenuiflorus	Mumbu	di, gi
Ricinus communis	Muono	di, du, gi, swa
Barringtonia racemosa	Muorong'ondo	-
Dalbergia melanoxylon	Muphingo	di, du, gi, swa
Avicennia marina	Mutsu	-
Saba comorensis	Muungo	-
Adansonia digitata	Muuyu	di, du, gi, swa
Millettia usaramensis	Mvamva	di, du
Vangueria infausta	Mviru	di, du, swa
Kigelia africana	Mvungunya	-
Milicia excelsa	Mvure	di, du, gi, swa
Adenium obesum	Mwadiga	di, du, gi, swa
Rhynchosia congensis		
Salacia madagascariensis	Mwambaro	-
Bridelia cathartica	Mwambeberu	-
Cissus sp.	Mwamchitophyo	-
Cyphostemma buchananii	Mwamchiviza	-
Tragea furialis	Mwamdzavi	di, du, gi, swa
Abrus precatorius	Mwamsusumbika	-
Terminalia prunioides	Mwarambe	-
Bombax rhodognaphalon	Mware	di, du, gi
Hibiscus sp. aff. vitifolius	Mwejenje	-
Cyphostemma adenocaule	Mwenjere	di, swa
Syzygium cuminii	Mzambarau	-
Rauvolfia mombasiana	Mzigande	-
Securidaca longipendiculata	Mziji	-
Eugenia sp.	Nchibandu	-
Diphasia sp. A*;*	Nchikoma	-
Ehretia bakeri		
Ehretia amoena;		
Vepris euginiifolia		
Heteropogon contortus	Nguji	-
Corchorus olitorius	Phombo	-

Julbernardia magnistipulata	Ukwe	-
Gonatopus boivinii	Ulanga	-
Tacca leontopetaloides		
Heteropogon contortus	Todza	di, du, swa
Bidens pilosa		

APPENDIX VII: Digo agricultural aspects in maize farming

Agricultural calender

The agricultural calendar of the Digo follows the lunar calendar, which in a given period can be related to the Greek calendar, but the two are independent. Currently (2003 – 2004), the first month [*mfungo mosi*] of the lunar calendar falls in November-December of the Greek calendar, and is the ninth month (*Shawal*) of the Islamic-Arab calendar. Up to about the mid 20th century, the monthly counting by the natural phenomenon of appearance and reappearance of the moon was combined with a four-day week calendar (*kualuka, kurima phiri, kufusa* and *chipalata*). The lunar months and the four days of the week were the main guide to farming activities. The first three days were spent in the 'family' farm, and *chipalata* was either a resting or a market day (Spear 1978), thus one conducted business or did optional farming on a farm field not shared by the family. These arrangements went hand in hand with the lunar calendar cycle, as summarized in Table 9.1

Table G.1: A summary of the Digo annual farming activities, for maize cultivation.

Season	***Main farming activity***	***Period: (Lunar calendar)***	***Activity notes***
Kazikazi [dry season]	Land preparation	*Mfungomosi-mfungotatu* [1st – 3rd month]	*tema tsanje* [clear new farm area]
		3rd month	*kurima dzindza* [clear old field]
		Mfungone [4th month]	*Kuocha maiyi* [burn cleared plant matter]
		4th month	*Kuumbiki* [sowing in dry soil]
Mwaka [long rains]	1st maize crop	*Mfungotsano* [5th month]	*Pandwa maji* [sowing in wet soil, in the rain]
		Mfungosita-mfungosabaa [6th – 7th month]	*kpwekpwe* [weeding and crop maintenance]
		Mfungonane [8th month]	*Kutsenga* [harvesting]
Mtsoo [low rains]	Other crop cultivation	*Mfungotisia-mfungokumi* [9th – 10th month]	Growing low rain demanding crops (peas, nuts, sesame etc.)
Vuri [short rains]	2nd maize crop	*Mfungokumi-mfungo kumi na mbiri* [10th – 12th month]	*Pandwa* [sowing], *kpwekpwe* [weeding] and *kutsenga* [harvesting]

The farming activities are announced by the *chirimira* [Pleiades] in the eastern sky. In Tanzania, Huber (2000) also noted the use of these stars by the Kwaya, who refer to these stars as *indimira*. The phrase *chirimira chikagwa* [the stars have fallen], means the stars are seen below the 'four o'clock' position of the sun (in East African solar patterns), and this indicates that the rains are about to fall, thus the period of leisure is over, and the time for cultivation is at hand. This occasion, although slightly varying between years, usually coincides with *mfungopili – mfungotatu* [first and second month of the lunar cycle). Farmers clearing new farm areas [*tema*

tsanje] should start as early as *mfungomosi* [first month], and farmers clearing old crop fields [*rima dzindza*] get busy in their farm fields a month later. In both cases, by *mfungone* [fourth month] the farmer would burn the piles of weeded plant material [*kuocha maiyi*]. For slashing and clearing [*kutema*] the farmer uses machete [*phanga*] and ax [*shoka*], while soil preparation [*kurima*] is done by hand-hoe [*jembe*]. This land preparation period (1st – 4th month) is usually dry, and is known as *kazikazi*. Some farmers prefer to sow before the rains, an activity known as *kuumbiki*. The disadvantage of *kuumbikia* is the loss of seeds through pest such as rats, and the advantage is the guarantee of the crop reaching maturity even when the rains stop prematurely, which is common in the area.

The first rains are expected at the end of the fourth month [*mfungone*], a season known as *chizima chandze* [putting off the heat], which coincides with the March-April period of the Greek calendar. The signal of rains is read from the production of new leaves in deciduous trees and production of flowers in some others e.g. *Albizia* spp. Some farmers prefer to sow their seeds during the rains, an activity known as *pandwa maji* [sowing in water].

In the past, each village had a 'prophet' to identify the person to ceremoniously start off the maize sowing [*ndiye gwira siku*], and everybody would only sow his seed a day after the selected person had sown. Neglecting this rule, a farmer would be summoned and would be required to pay a fine to the committee of elders [*ngambi*].The strength of luck [*chuso*] of the selected person will determine the maize yields in that year. In a homestead, the man who heads the homestead will be the first to farm and to sow, then the rest of the family follows. However, he can delegate his ceremonial action to a daughter or son, trying their *chuso*. If the crop yield for that year is good, then the 'starter' is maintained, but if the crop yield is poor, another person is selected. There are prohibitions [*miko*] for the 'starters' at village and homestead levels. Among others, these include abstaining from sexual intercourse on the eve of sowing. These communal rites connected to sowing are not practiced today.

The first rains, *ingu ra popho* [the rains of the butterflies], are interpreted as the migration period of butterflies (*popho*) flying from North (*vurini*) to South (*mwakani*) to get dressed up (become colorful). These rains mark the beginning of the long rain season [*mwaka*], which extend from the fifth month [*mfungo tsano*] to the eighth month. Between the 5th and the 7th month is the period of very heavy rains, and *kpwekpwe* [weeding] is the principal occupation of men and women during this season. Within the sixth month [*mfungo sita*] the rains are referred to as *ingu ra kubwaga nyoe* [the rain that 'drops' grasshoppers, which stay in the maize plant]. Within the sixth month, the maize plants start to produce stigma [*njiyo*], a process described as '*ganasonga*' [plaiting]. In the seventh month heavy and continuous rains for a week or more [*ingu ra mfungizo*] are expected and mark the end of the rainy period of *mwaka*, i.e. *mwaka unalaga* [the long rains are bidding goodbye]. In the seventh month [*mfungo saba*] the kernels in the cob start to develop and by the end of the month the cobs are ready for roasting to eat [*gakuocha*]. At this stage the cobs lose the stigma, a processed described as *matsere ganakata njio* [cobs are losing the stigma], and the cobs start to dry up [*ganakala kundu*]. The rains disappear gradually, and by the 8th month it is relatively dry. By the end of the eighth month, four months after sowing, the cobs are dry [*matsere*

n'mafu] and are harvested. In the past, weeding and harvesting were done by cooperating groups [*mwerya*], from one farm to another, but this is not common today.

Mfungotisia [9th month] and *mfungo kumi* [10th month] are characterized by low rains, a season known as *mtsoo*, and used for growing low rain demanding crops e.g. green peas (*podzo*), sesame [*ufuha*], ground nuts [*njungu nyasa*], bambara nuts [*njungu mawe*] etc. *Mfungo kumi* [10th month] to *mfungo mosi* [1st month] is the short rains season, known as *vuri*, when a second maize crop and the low rain demanding crops are cultivated. Some farmers prefer to grow cassava in *mtsoo* and *vuri* seasons.

***Chibuundzi* celebration**

The first day after completing the collection of the maize crops is known as *Mwaka hija*. The women spend the day preparing the maize harvest by pounding and grinding [*kuhwa na kusaga*]. The second day, known as *Mwaka kafu*, celebration preparation begin with farmers going back to the farm to 'hide' the farming tools and fishermen going to the sea to remove their boats from the water and hanging their fishing tools. This is to put off all work related activities, and to get ready for the feasting set for the next day, the third day after harvesting, which is known as *Chibuundzi*. The *Chibuundzi* day is described as a holiday, and from a traditional perspective it is like the Islamic or Christian celebrations. On that day people spread ash around their houses; failing to do that the family will suffer [*kushutwa n'chibuundzi*] by having their chickens stop producing. On that day, people celebrate the harvest by taking a bath [*kuoga mwaka*], slaughtering animals, dancing and eating food prepared from the maize. If this day falls on a Saturday or a Tuesday, the long rains are referred to as male [*mwaka mlume*] and the crop yield is expected to be low.

Chibuundzi and *kuoga mwaka* are more or less historical practices today, and there is evidence that the abandonment of this practice is predominantly due to religious attachments, since to some extent it contradicts the teachings of Islam. At the time of this study, very few Digo still undertake this celebration, done as a family issue rather than the historical communal celebration.

Post harvesting processes and storage

In maize harvesting, the cobs are snapped or husked by hand from the standing stalk and piled for collection and transportation to the homesteads. At home, selection of the more vigorous maize cobs is done, which are separated as seed for the next crop. The remaining cobs are stripped off the husks and put in a granary [*chitsaga*], which is a raised bed built above the fire place (about 2 m in height), at a size that depends on the maize to be stored. The fire underneath is maintained to burn continuously, otherwise the maize would rot. The leaves on the seed-cobs are only partly removed, and used to hang the cobs near the granary. In this form the family members know which maize not to consume. The cobs in the granary are used according to the needs of the family. The kernels are manually retrieved into a basket, which is usually done by women and children. The *kernels* are pound [*kuphonda*] and ground [*kusaga*] for making porridge [*uji*], hard pulp [*sima*] or grained pulp [*mashaza*]. Usually the maize produced by the Digo farmer is for domestic consumption. Most farmers complained that their harvest does not even suffice their household needs, usually lasting less than half a year.

Other crops such as peas are preserved in containers, gourds or large bottles. Pests are detracted by adding dried and ground chilli with the preserved seeds. This is usually the case with *mbeyu* (seeds to be used for the next crop), which usually receive extra care to ensure they are not damaged by pests.

Fruits (e.g. mango), vegetables and root tubers (e.g. cassava), are preserved by drying in the sun. This was particularly common in the past when famine periods were frequently anticipated. There is a belief that when the mango trees produce excessively, that is an indicator of famine in the near future, thus the fruits were not left to go to waste but processed and preserved for the famine session. When needed for consumption these dried fruits and vegetables are soaked to smoothen first and then cooked. Cassava tubers are pounded into flour from which hard pulp [*bada*] is prepared.

Traditional customary controls in the Digo farming system

Like other traditional Digo practices, farming has been under customary control of an elders' council, *ngambi* (Spear 1978). The *ngambi* enforced announcements through beating of drums or by messengers who moved through the village announcing the elders' instruction, mainly related to planting and harvesting of crops. These included the selected person to start off sowing.

The growing patterns of crops were also under the *ngambi*. Thus the sowing of Bambara ground nuts [*Njugu mawe*] was restricted to the *mtsoo* season, and a farmer who sowed these nuts in the heavy rains [*mwaka*] season was fined. This traditional rule resulted from the belief that the Bambara nuts attract sun-shine, thus when planted in the long rains would lead to less rains or even drought. Consequently, for such fault a farmer was fined a black bull that was given to the *ngambi* who used it in a ceremony to appease the spirits of the rains.

The harvesting of coconut fruits, until very recently (early 1990s), was also controlled by the *ngambi*. The elders made a special structure (*kaha*) from the coconut leaves and raise it at a central site of the village as a sign that there should be no more harvesting or collection of coconut fruits from farms. The order affected even the use of coconut fruits in the households, meaning a total ban of use and trade of the coconut fruit of all stages in that period. This control was meant to discourage stealing and over-use, so that the fruits were given enough time to mature fully and in large numbers. The ban was removed by bringing down the *kaha*, at a time when the coconut fruits were in high demand and fetched good prices, e.g. in the month of Ramadhan, when demand extends to the neighbouring Swahili speakers.

In all villages visited, all these customary controls were no longer in action. Thus control and decisions on farm activities and production were made at the homestead level.

Table G.2: Digo names of different varieties or cultivars of crop plants

Crop plant	Variety	Description
Matsere [maize]	*Chfumba tele*	High producing cultivar
	Chitweka	Black kernels
	Katumani (also known as *Matsere ga chizungu*)	Hybrid maize, short and matures in a relatively short period
	Kosti (also known as *Matsere ga chizungu*)	Hybrid maize, grows tall and produces abundantly
	Mbokomu	-
	Matsere ga bumubumu	Fast growing cultivar
	Maricheni	Yellow kernels
	Mwatsaka	Red kernels
	Tsere ra mjundo	Stripped colour patterns
	Tsere ra matungo	Black, red, and white kernels
	Zonga	Short cultivar
Kunde [Peas]	*Chimakoko*	Grows up right
	Chifumbatele	Has comparative high yields
	Koroboi	Is short
	Zonga	Grows more in twining way
Mwatsaka [pepper]	*Mwatsaka wa chitsawetsawe*	Very small and very hot
	Mwatsaka ng'ondzi	Large and very hot
	Mwatsaka gowa	-
	Mwatsaka wa masala	Deep red
	Mwatsaka mbuzi	Round, green and very hot
	Mwatsaka manga	small, round and black
	Mwatsaka wa vipuli	Round with a log stalk
Podzo [green peas]	*Podzo-za-msamli*	Light green peas
	Podzo-nyiru	Dark green peas
Ufuha [Sesame]	*Ufuha-mwiru*	Lighter sesame seeds
	Ufuha-mwereru	Black sesame seeds
Mbalazi [cow peas]	*Mbalazi-nyereru*	Light brown seeds
	Mbalazi-mnjindo	Striped seeds
	Mbala-bombo	Dark brown seeds
Manga [cassava]	*Boriti*	Think, long tubers, with darkish rind
	Boto	-
	Chango	-
	Chibandameno	Sweet, light coloured rind, and white flesh
	Chijenje	-

Table G.2 Cont.

Crop plant	Variety	Description
	Chileso	Bitter, dark coloured rind, and white flesh
	Chiphukuse	Small tubers, produce abundantly
	Gushe	Very dark rind
	Guzo	Thick and long tubers, with lighter rind
	Gwede	-
	Kabagi	-
	Kabatwa	-
	Mbega	-
	Mjiriama	Dark coloured rind, and peeling outer cover
	Mwamundu	-
	Mzurilewao	-
	Ride	-
Mgomba [banana]	*Bokoboko*	Medium sized fruits, mainly for cooking
	Buli	-
	Chibungale	Small fruits, mainly for eating raw
	Chiivu	Very small fruits, mainly for eating raw
	Chipembe cha ng'onzi	Short fruits
	Chisukari	Small fruits, produced abundantly. Mainly for eating raw, and are very sweet (sugary).
	Chitombo	-
	Choga ivu	-
	Gojozi	Short but thick fruits, both for eating raw and for cooking
	Jamaica	-
	Malindi or *Mdundatsi*	Medium size fruits, produced abundantly, mainly for eating raw
	Matoke	Short and reddish fruits mainly for cooking
	Mdzavudzo	-
	Mkono wa tembo or *Kamakwa*	Very long fruit, produced less than 3 fruits at a time. Mainly for cooking

Table G.2 Cont.

Crop plant	Variety	Description
	Mshale	Large fruits mainly for cooking
	Mtsuzi wa kamba	Fruits are reddish in colour, mainly for eating raw
	Muareare	-
	Ndizi ya chilume	Large fruits mainly for cooking
	Ndizi ya chitsambala	-
Mphunga [Rice]	*Chibawa cha inzi* or *Chitumbo*	Seeds have wings
	Gushe	-
	Kanja	-
	Maria	-
	Mosi wa sigara	Dark brown seed cover
	Nimukora	-
	Pishori	Aromatic long grain
	Sindano/lokoli	Long grain
	Singo ya mjali	-
Muhama [Sorghum]	*Muhama mrefu*	Tall growing
	Muhama wa bombo	Reddish seeds
	Muhama wa fumbula	Large bunch seeded
Mawa	*Mawa maru*	Pale brown fruits
	Mawa mereru	Whitish fruits
Tungudza [African egg plant]	*Tungudza za chidunguluma*	Small round fruits
	Tungudza za tovu ya ng'ombe	Large, long fruits
Mabungulia [Egg plant]	*Bugulia kunda ng'onzi*	Short, thick fruit
	Bungulia ga tovu ya ng'ombe	Long fruit
	Bungulia mdundatsi	Long and heavy fruit
	Bungulia ga dunguluma	Round fruit
	Bungulia ra chizungu	Hybrid cultivar with very large fruits
Maembe [mango]	*Batawi*	Medium sized fruit, round, and combined yellow and red shades when ripe
	Boribo	Large fruit, curves slightly at the tip, and when ripe combines red and yellow shades
	Chikunguma	-
	Chimaji	Medium sized fruit, round, very juicy and sugary

Table G.2 Cont.

Crop plant	Variety	Description
	Ching'ongo	-
	Chisukari	Small, round fruits, very sweet
	Dobe	-
	Dodo	Large round fruit, remains green even when ripe
	Dzunga	-
	Ember a chidigo	Small fruits, very fibrous flesh
	Embe-mango	A new cultivar
	Epoli	Large, round fruit, with a very small seed. It reddish even at immature stages, but becomes more red when ripe
	Faransa	-
	Kasuku	-
	Ngoe	Large fruit, which curves at the tip, when ripe it changes to completely yellow.
	Sapai	-
	Shikio punda	Long fruits, also fibrous flesh
	Tovu	Long fruits
	Zafarani	Slightly long, and shiny red when ripe
Mpapali [pawpaw]	*Moyo mwereru*	Fruit with yellow inner flesh, of different sizes and shapes
	Moyo wa simba	Fruit with red inner flesh, of different sizes and shapes
Nanasi [pineapple]	*Nasi ra baka*	Large fruit
	Nanasi ra chidigo	Small fruits, sometimes grow wild in uncultivated farm areas