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Diverse Leadership Methods

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Highlights

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Manifestation of Contemporary Leadership Issues and its Relevance to Diverse Leadership Methods and Contingency Models: A Review of Literature

By Olufemi Akintunde
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Abstract - Wren (1995) explains that, "leadership remains an ambiguous, amorphous, and frequently misunderstood topic" (p. ix). Therefore, isolating and discussing a limited number of leadership models may suggest one is more significant than the other. This paper purposefully lacks the attachment of special significance, and instead, offers a limited focus on certain contingency theories. The present paper reviews the literature of studies conducted by using diverse leadership methods, the similarities and differences in these leadership models.

Keywords : *diverse, leadership methods, transactional, transformational, situational, charismatic.*

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Manifestation of Contemporary Leadership Issues and its Relevance to Diverse Leadership Methods and Contingency Models: A Review of Literature

Olufemi Akintunde

Abstract - Wren (1995) explains that, "leadership remains an ambiguous, amorphous, and frequently misunderstood topic" (p. ix). Therefore, isolating and discussing a limited number of leadership models may suggest one is more significant than the other. This paper purposefully lacks the attachment of special significance, and instead, offers a limited focus on certain contingency theories. The present paper reviews the literature of studies conducted by using diverse leadership methods, the similarities and differences in these leadership models.

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I. Introduction

The purpose of the paper is to review the literature available of variables namely diverse leadership methods, comparing and contrasting leadership models with contingency models. In most of the studies reviewed diverse leadership methods were used as the criterion variable, comparing and contrasting leadership models and contingency models as the predictor variables. The review of literature is presented mainly in two areas. First, the diverse leadership methods are presented and second findings of studies relating comparing and contrasting leadership models and contingency models are presented.

II. Diverse Leadership Methods

a) *Transactional Leadership*

Transactional leadership is an exchange of the subordinate's competence, and commitment for the rewards and recognition from the leader. This type of leadership produces short-lived relationships between subordinates' and leaders. This model of leadership is goal-oriented, and comprised of quick transactions that both parties can benefit from. It promotes self-interest and neither the leader nor the subordinates feel attached to one another. According to Wren (2006), transactional leadership occurs when one person takes the lead in making contact with the other for the purpose of an exchange or valued thing. Wren further postulated that the work of Graen and his associates show that the process between leaders and subordinates can be positive if the exchange is positive and is associated with morale and value.

b) *Transformational Leadership*

Transformational leadership focuses on bringing change to the relationship between leaders and subordinates. The leader inspires and encourages the subordinate to maintain a positive attitude and to perform tasks given to him or her to the best of his or her ability. The transformational leader seeks to bring change to the organization and uplift those they lead, through his or her attitude, passion, and persuasion. This leadership model creates an atmosphere in which the subordinates feel accepted and cared for. It also creates a type of relationship that enables the followers to feel the need to give more, and thus feel successful. This theory of leadership emphasizes a vision and the leader sells the vision to the subordinates. Much energy and effort is put into getting subordinates to buy into this vision; therefore trust, integrity, and commitment to the vision is an integral part of this type of leadership. Subordinates are highly motivated in this relationship, and they usually participate more because they feel accepted and valued. According to Kark, and Shamir as cited in Avolio, and Yammrino (2002) transformational leadership is associated with high levels of individual and organizational performance. Research by Bass (1995, 1998), "transformational leadership is characterized by four dimension, charisma, inspirational motivation, intellectual stimulation, and individual consideration" (Trepanier, Fernet, and Austin).

c) *Situational Leadership*

According to Wren (1995), situational leadership describes the way leaders adapt their behaviors to the features of the situation and the follower. This model deals with the follower's readiness level and emphasizes the leader's sensitivity to the level of readiness the follower exhibits. Wren (1995) further stated that readiness is defined as the follower's ability and willingness to perform a task. This model focuses on the level of maturity of the follower as the primary motivation of the leader's response. The leader responds differently

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and strategically based on several factors. The situational model posits that the developmental levels of the leader's subordinates play the greatest role in determining which leadership styles are most appropriate. The situational model outlines four types of leadership behaviors that result from combining high and low supporting behaviors; namely, (listening, providing feedback, and encouraging). These behaviors are reciprocated with high and low directing behaviors, such as (administering, instructing, and monitoring). It is the goal of the leader to get subordinates to accomplish his or her own set of goals. According to Yukl (2006), the length of time it takes to increase the subordinate's maturity depends on the complexity of the task and the skill and confidence of the subordinate.

d) Charismatic Leadership

According to Couto, as cited in Wren (1995), charismatic leadership is focused on serving others. Leaders develop shared goals with their followers, and inspire subordinates to aspire toward those goals. This theory stresses the importance of presenting an appealing and motivating vision that resolves conflicts, and providing followers with meaning and direction.

e) Clawson (2006) House's Theory of Charismatic Leadership Is Measured by Several Factors

1. The followers trust in the correctness of the leader's belief;
2. The unquestioning acceptance of the leader by the follower, and
3. Emotional involvement of the follower in the mission of the organization. According to Wren (1995), the charismatic leader brings change to the subordinate by, envisioning, energizing, and enabling. The leader creates a vision and sells it to the subordinate in a compelling, exciting manner. This leadership empathizes with the follower and express support for the follower in times of need.

III. Comparing and Contrasting Leadership Models

There are similarities and differences in these leadership models. It is important to understand that although there are similarities and differences, effective leadership addresses the moral principles of the individuals who are a part of the group. Transformational and transactional leadership are similar in that they both represent some form of exchange. Both theories of leadership represent some motive. These two theories motivate the subordinate to complete a task, even though the transformational motive is more genuine than transactional. In the transactional leadership model the exchange is more formal, whereas the transformational leadership is more interpersonal. In both exchanges, the leader, and the subordinate influence each other. In addition, both theories are a two way process in which both get individuals to perform and thus both gain from this relationship. Although there are differences, each type of leadership is important and each model can be used to fulfill certain requirements in an organization.

The differences between transactional and transformational leadership are many, but for the sake of this paper only a few will be discussed. Transactional leadership comes mainly from the leader's need to fulfill a mission or accomplish a plan. While transformational leadership is not only influenced by the leader's needs but also from the needs of the subordinates. Transactional leadership is short-lived. Once the goal is accomplished, the relationship will most likely be finished, whereas, transformational leadership encourages a long-term relationship where the subordinate's morals and values are taken into consideration. The main focus of transformational leadership is to develop the full potential of its followers and help them move into the leadership role. Whereas the focus of transactional leadership is on recourse exchange, monitoring and controlling subordinates through rational or economic means.

There are also similarities and differences between transformational and charismatic leadership. Charismatic like transformational leadership encourages and motivates the subordinate. They present a vision to the followers, and the followers buy into this vision. They inspire, influence, and motivate subordinates to perform beyond expectation. According to Avolio and Yammarino (2002), these types of leadership use different loyalty of the followers in pursuing their visions.

The situational and transactional leadership models are similar in that they both focus on behavior according to the situation. They both deal with exchange, and influencing the subordinates to get things done. The situational model allows adjustments in the leader's behavior according to the situation. The transactional leadership controls the exchange and reward or punishment based on the follower's performance.

IV. Comparing and Contrasting Contingency Models

Wren (1995) explains that, "leadership remains an ambiguous, amorphous, and frequently misunderstood topic" (p. ix). Therefore, isolating and discussing a limited number of leadership models may suggest one is more significant than the other. This paper purposefully lacks the attachment of special significance, and instead, offers a limited focus on certain contingency theories.

According to da Cruz, Nunes, and Pinheiro (2011), competitive companies create a need for leaders who not only develop their followers but also create an environment of commitment. The authors asserted that one of the most important contingency theories,

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developed by Fiedler, has value that "lies in the fact that it is the first to be concerned with adjusting leadership styles to situations" (p. 19). According to Nahavandi (2006), Fiedler believed that "leadership effectiveness is a function of the match between the leader's style and the leadership situation," and leader effectiveness depends on a leader's style matching the situation (p. 134).

Nahavandi (2006, pp. 134-135) explains that Fiedler's least-preferred co-worker (LPC) scale identified a leader's style and whether relationship or task incentives formed the basis of the style, which dictates a leader's priorities and goals toward maintaining a relationship or accomplishing a task. Whether a leader changes his or her style based on a situation remains a basic premise of this model and Fiedler focused on the leader's need "to learn to understand and manage the situations in which they lead" (Nahavandi, 2006, p. 140). Even though there has been recent review validating Fiedler's work, the model remains controversial because of this premise (Wren, 1995, p. 87).

In addition to leadership style, Fiedler believed other factors existed and as a result he developed a model integrating "situational parameters into the leadership equation" (Wren, 1995, p. 86). These factors include the relationship between leaders and followers, task structure, and how much power leader's use when rewarding or penalizing followers (Wren, 1995, p. 86). Followers usually favor agreement with requests from leaders when their relationships are good, and leaders are better able to direct when tasks remain structured (Yukl, 2006, p. 216).

Within current organizational settings, da Cruz, Nunes, and Pinheiro (2011) note that, "contingency theory represents a change in leadership research in as much as it ceased to focus only on the leader, to focus rather on the leader and the situations where he leads" (p. 23). The authors also note that, "even those who criticize should agree that the development of the contingency model challenged the assumption that there is 'one best way' and that the model supplied a valuable little step towards conceptualization of leadership" (p. 23).

A model similar to Fiedler's is the Normative Decision Model, developed by Vroom and Yetton, identifying "characteristics of follower acceptance and structured information availability" (Wren, 1995, p. 89). This model, like Fiedler's, also suggests that leaders adapt to the situation; however, the two models deviate in several ways. Although Fiedler's model involves general leadership, Vroom and Yetton's model limits itself to decision making. It makes the assumption that leaders can change their decision making style, and that leaders have greater concern for the value of their decisions than with follower performance. The model makes use of a decision tree, which takes the user through a series of sequential questions with the goal of helping a manager choose the decision style most important for a particular problem. (Nahavandi, 2006, p. 142-146).

Nahavandi (2006) also explains there are those who theorize that the model has two primary flaws.The model's complexity prohibits its use from a practical point of view because of the amount of time needed when working through the questions in the decision tree, and the model assumes leaders can use any style on an equal basis. There may also be potential bias as the model depends on a self-reporting concept. These weaknesses could well limit its use within current organizational settings. (Nahavandi, 2006, p. 145-147).

While both models have similarities, Nahavandi (2006) explains their differences are distinctive. For example, the Normative Decision Model's focus has limitations as compared to Fiedler's model, and Nahavandi makes the point that some of the decision styles may pose more of a challenge for managers (p. 147). Fiedler's model makes the assumption that "the leader's style (LPC) is determined by internal traits and therefore difficult to change," while Vroom and Yetton's model relies on learnable methods (Nahavandi, 2006, p. 150).

The Situational Leadership Model involves the premise that a leader should change his or her style based on the situation and although considered a popular model, it "has few theoretical bases and little research support" (Nahavandi, 2006, p. 181). Its foundation rests in the relationship between leaders and followers, and an alteration of behaviors by leaders "based on the ability and willingness of subordinates to complete the task" (Nahavandi, 2006, pp. 181-182).

The model is similar to Fiedler's model as well as Vroom and Yetton's, in that the primary behaviors center on relationships and tasks. Those behaviors combine, creating four behaviors (telling, selling, participating, and delegating), one of which leaders choose based on a particular follower's level of maturity. For example, if a follower ably and willingly completes a task, the leader delegates, encouraging participation by the follower. Should a follower have the will but not the ability, the leader explains the steps needed for task completion. The model makes the assumption that leaders can maintain an awareness of their followers' maturity level and abilities. (Nahavandi, 2006, pp. 182-183).

According to Nahavandi (2006), some failings in the model exist, one of which is a lack of consideration for the structure of the task. Additionally, the model provides no clear definition for maturity, no guidance for a leader's assessment of someone's maturity level, and once assessed, a lack of definition exists for the means of matching leader behavior to the maturity level. Considered as one of the least effective contingency models, the model has had a greater impact on leadership practice than other theories. The author

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suggests the model's popularity lies in its simplicity and in the attractive notion that leaders alter their style. (Nahavandi, 2006, p. 183)

Tasks and relationships also form the basis for the path-goal theory of leadership, developed as a means of explaining how a leader's behavior influences both the performance and the satisfaction of followers (Yukl, 2006, p. 218). This model "proposes that the leader's role is to clear the paths subordinates use in order to accomplish goals" (Nahavandi, 2006, p. 168). The central idea is "the concept of exchange between leaders and subordinates, whether it is an implicit or explicit contract" (Nahavandi, 2006, p. 168). Further, according to Nahavandi (2006), relationships formed by leaders and followers have a give-and-take approach; the leader provides support and the follower produces, becoming satisfied with the outcome (p. 168).

Landrum and Daily (2012) note that because of increased pressure on accountability within organizations a greater need exists for the development and linkage of standards for organizational principles and performance. Describing the path-goal theory as "a theory of individual leadership behavior," the authors suggest its use as a means of recognizing a way of increasing accountability (p. 56). Described by Nahavandi (2006) as an "expectancy model of motivation," the primary basis of the path-goal theory involves the ways followers make informed choices about their behavior based on how they perceive the importance of performance and effort contributing to valued outcomes (p. 168). Additionally, an important aspect of this model, as noted by Nahavandi (2006), is the understanding that leaders consider follower needs before making any decisions about their own behaviors (p. 169).

In Avolio and Yammarino (2002), Bass asserts that one's understanding of leadership continually evolves and that, "the flexible organization will be the rule rather than the exception" (p. 375). However, Luftman (2004) writes that "people find comfort in the way things have always been done," and when change disrupts comfort, fear results (p. 263). Effective leadership involves continual learning and the development of skills enabling leaders' adaptation to ever-changing situations. In a constantly changing business environment, the need for adaptability remains an essential skill for leader viability. (Avolio and Yammarino, 2002).

In Wren (1995, pp. 456-457), McFarland, Senn, and Childress note that leadership assumptions and beliefs in the future require redefining. Further, in an ever-changing economy and with a workforce becoming increasingly diverse and technologically challenged, old behaviors will, of necessity, transform into new ones. Bass (Avolio and Yammarino, 2002, p. 380) also notes that any current trends will become ordinary by 2034. "Theories, if they are any good, are meant to be displaced" and future theories require a consideration of many factors, not the least of which are virtual teams, online learning, workforce diversity, and medical and technological advances (Avolio and Yammarino, 2002, pp. 380-381).

V. Conclusion

The review of literature gives a mix findings relationship between the diverse leadership methods. One may then conclude that contingency theories, and others popular in the leadership field today, may not be viable in the future unless they somehow adapt to change.

a) How Each Leadership Model Addresses Contemporary Issues and Challenges?

Although different leadership styles cater to different situations and are used by leaders to accomplish goals or tasks, no one approach is best. The most important thing to consider is that each leadership style brings about change.

b) Culture

Transformational leadership can address the issues of culture within the workplace. Culture affects the operations of any organization. Followers from various ethnic and social backgrounds come with their different cultural perspectives, which can affect how they interact with leaders. It is critical to recognize and acknowledge that there are different cultures, and these differences can affect leadership, and the internal affairs of any organization.

According to Nahavandi, A. (2006), "leadership is a social cultural phenomenon, and leaders, and particularly founders, are instrumental in creating and encouraging the culture." Culture in the workplace can create challenges in leadership. Nahavandi emphasizes that affects values and beliefs and influences leadership and interpersonal styles. Transformational leadership empowers subordinates regardless of culture, race, ethnic, religious or socioeconomic background. Transformational leadership upholds values, morals, and ethics, and does not compromise an individual's belief, which includes his or her culture. The different leadership styles can influence subordinates on how they act and how they respond to situations. Through the leader's interaction with subordinates, leader can influences how flexible and open-minded subordinates should be.

c) Communication

Communication is essential in any organization or group. If missions and visions are not communicated effectively, this can present issues that challenge leadership in contemporary society. Transformational as well as charismatic leadership give individual consideration to the subordinate. Leaders must be able to express ideologies and visions in an effective way.

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Transactional leadership, on the other hand can also address the issue of communication. Because the motives are clear, the subordinates receive a reward, whether positive, or negative for work completed. There is no middle ground, subordinates know what they are getting into, and leaders know what to expect. Situational leaders can communicate with subordinates based on their level of maturity. Thus communication can be effective and be on a level that the follower can understand. Leaders can communicate praise for job done, encourage interpersonal skills among leaders and subordinates, and give subordinates a voice in decisions made.

VI. Future Scope

This study was based on extensive review of literature highlighting the variables namely diverse leadership methods and how each leadership model addresses contemporary issues and challenges. Further research is needed taking into consideration the empirical data of present level of diverse leadership models and contemporary issues and challenges in different industries in Nigeria. Focusing on diverse leadership models and the impact of contemporary issues and challenges in Nigeria establishment might be of great use to educate the society in this area. The research will also help in endorsing the validity of incorporating diverse leadership intervention alongside the recruitment and selection process and the training and development process of leadership personnel.

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Ethno-Medicinal Practices among the Limbu Community in Limbuwan, Eastern Nepal

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Abstract - Limbuwan is the land inhabited and dominated by the indigenous Limbu people. The Limbu are very rich in ethno-medicinal knowledge and culture as well. The main objective of this work is to document the ethno-medicinal knowledge of the Limbu community with semi-structured interviews and questionnaire methods. A total of 225 species, in 191 genera and 92 families, in terms of life form, 100 herb species, 48 tree species, 46 shrub species and 25 climber species were documented as medicinal plants in Limbuwan. Among these, 52 species are used for the treatment of gastrointestinal disorders, 40 species for cut-wound-burn (CWB). The ethno-medicinal treatments are performed by Limbu healers (Phedangma) who have immense knowledge of ethno-medicine. Among the various categories, 112 species for oral administration, 92 species in extract form and root part of 67 species are used in Limbu community. This study found that the Limbu community uses more plants than other ethnic communities. Despite the efficacy of the indigenous knowledge it is gradually eroding day by day in the name of civilization.

Keywords : *community, limbu healer, medicinal plants, indigenous.*

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Ethno-Medicinal Practices among the Limbu Community in Limbuwan, Eastern Nepal

Dil Kumar Limbu [α] & Basanta Kumar Rai [σ]

Abstract - Limbuwan is the land inhabited and dominated by the indigenous Limbu people. The Limbu are very rich in ethno-medicinal knowledge and culture as well. The main objective of this work is to document the ethno-medicinal knowledge of the Limbu community with semi-structured interviews and questionnaire methods. A total of 225 species, in 191 genera and 92 families, in terms of life form, 100 herb species, 48 tree species, 46 shrub species and 25 climber species were documented as medicinal plants in Limbuwan. Among these, 52 species are used for the treatment of gastrointestinal disorders, 40 species for cut-wound-burn (CWB). The ethno-medicinal treatments are performed by Limbu healers (*Phedangma)* who have immense knowledge of ethno-medicine. Among the various categories, 112 species for oral administration, 92 species in extract form and root part of 67 species are used in Limbu community. This study found that the Limbu community uses more plants than other ethnic communities. Despite the efficacy of the indigenous knowledge it is gradually eroding day by day in the name of civilization.

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I. Introduction

The Limbu ethnic community belongs to the *Kirati* group of the Tibeto-Burman family. They are often wrongly believed to be an offshoot of the Mongol by those who misinterpreted some Western scholars' use of the term 'Mangol' or 'Mangoloid' to refer to the Limbu's complexion. Their home land or the land of origin used to be called *Pallo Kirat* (far Kirat) in the past, but now it is known by the name Limbuwan, which means 'Limbu land' in the Persian language. The Limbu are culturally very rich. They have their own cultural dances and songs. The Limbu are also rich in literature. They use a script called the Sirijunga script nomenclatured after its inventor Sirijunga. Their religion is called the *Kirat* religion.

The Limbu people reside near jungles and streams in the hills of Limbuwan because their lifestyle is overwhelmingly dependent on natural resources. Their territorial land covers mainly Sankhuwasabha, Tehrathum, Dhankuta, Taplejung, Panchthar and Ilam districts of Nepal, but a large number of the Limbu people also live outside Limbuwan, viz. Sikkim, Darjeeling and some part of the North East region of India.

The Limbu enjoyed a special system of land ownership called *Kipat* since time immemorial. They also had the right to local governance under the leadership of a village head man called Subba. Limbuwan was thus governed by different Subbas and was autonomous or semi-autonomous until a few decades ago. When the Land Reform Act was enforced in the *Limbuwan* area in 1965, the Limbus lost their power to land and local governance forever. Limbu communities have immense knowledge on ethno-medicine and a rich cultural, and food heritage (Bista, 1967; Subba, 1999a; Subba, 1999b). The Limbus have excellent traditional knowledge base (Rai et al., 2004) and extraordinary innovativeness. They have been using hundreds of plants for the treatment of diseases (Siwakoti, 1998), ranging from diarrhea, constipation to fracture. ***Phedangma, Shamba and Yeba-Yema*** are their sacred specialists (Limbu shamans). They have rich knowledge of diseases, their identification, and application of herbal medicines for their cure.

This knowledge is valuable not only to those who depend on it in their daily lives, but also to modern industry and agriculture. Many widely used products, such as plant-based medicines and cosmetics, are derived from traditional knowledge. Traditional knowledge can make a significant contribution to sustainable development. Most indigenous and local communities are situated in areas where the vast majority of the world's plant genetic resources are found. Their skills and techniques provide valuable information to the global community and a useful model for biodiversity policies. Furthermore, as on-site communities with extensive knowledge of local environments, indigenous and local communities are most directly involved in conservation and sustainable use.

Ethno-medicine is a set of empirical local practices on the basis of indigenous knowledge of a social group often transmitted orally from generation to generation. Ethno-medicinal knowledge on plant resources has been constantly diminishing because of changing perception of the local people, increasing influence of global commercialization and socio-economic transformation (Gadgil et al 1993; Kunwar and Adhikari 2005). Due to the lack of scientific

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harvesting, proper management techniques and lack of conservation awareness, the number of ethno-medicinal plants is decreasing (Kunwar and Duwadee 2003). All the people of Nepal have no access to allopathic medicine and health centre because of illiteracy, poverty and unavailability. Thus, about 80% of the population in Nepal relies on traditional medicine (Manandhar, 2002).

The main objective of this study was documentation and analysis of ethno-medicinal knowledge of the Limbu people of Limbuwan area and its vicinity.

a) Study Area

The research work was conducted in the Limbuwan area of Eastern Nepal. Limbuwan is an area of 14619 km^2 of the eastern part of the Nepal Himalaya, comprising Taplejung, Panchthar, Ilam, Jhapa, Tehrathum, Dhankuta, Sunsari, Morang districts and some parts of Sankhuwasabha ~~d~~District. Its geographic co-ordinate is 87° 12′ 36″ E to 88° 06′ 51″ E and 26° 22′ 12″ N to 27° 46′ N. Limbuwan borders the Arun and Koshi Rivers in the West, the Kanchenjunga Himalaya and Tibet of China in the north, the Mechi river in the east, and Bihar and West Bengal province of India in the south (Figure 1). The area is predominantly inhabited by indigenous Limbu people since time immemorial. Limbuwan falls under the southern aspect of the Himalaya range and humid climate which is suitable for luxuriant vegetation with diverse biodiversity. It is important to note that Limbuwan lies between the third highest peak of the world (Kanchenjunga: 8586 m) and the lowest point of the country (Kechana: 70 m).

II. Materials and Methods

The primary data were obtained on site through participant observations, semi-structured interviews (Key Informant and Focus Group), and questionnaires.

The secondary data were obtained from District Development Committee, different literature such as those from Central Bureau of Statistics, WHO, National Reports on CBD, ANSAB, IUCN, and various national and international journals dealing with ethno-medicine, biodiversity, traditional knowledge, and sustainable utilization of natural resources.

Fieldwork was carried out four times from January 2009 to December 2011. We used the methods from ethno-botany (Martin, 1995) and ethnography (Spradley, 1979). Prior informed consent was obtained orally from each informant. Information was collected through open-ended and semi-structured interviews in which topic guides, questionnaires, drawings, photographs and living plant materials were used as auxiliary resources. A participant observation technique was also applied. Identified specimens in the field were noted down. Unidentified specimens were collected and herbarium made. The plant herbaria were identified in National Herbarium House, Godawari, Nepal. Twenty key informants (Limbu people) were selected by consultation with knowledgeable persons of the study area and interviewed on issues relating to ethno-medicine (using a combination of semi-structured questionnaires and free-listing technique). Data were recorded in fieldwork books and, when possible, the interviews were also recorded on voice recorder.

III. Results and Discussion

A total of 225 species of medicinal plants were documented from the Limbuwan area. These were distributed among 191 genera and 92 families (Appendix). The species in the Appendix are arranged alphabetically by family and by genus. For each species, the common name(s), Limbu name, medicinal applications, used parts, mode of preparation, mode of administration and habit of medicinal plants are mentioned.

Numerous Limbu plant families contain a large number of species with reputed medicinal properties (Appendix). Families with the largest number of species are the following: Fabaceae (14 species), Cucurbitaceae (11species), Asteraceae (10 species), Lamiaceae, Poaceae, Rosaceae, (8 species), and Zingiberaceae, Euphorbiaceae and Moraceae (7 species) (Appendix). The majority of Limbu medicinal species are herbs (100 species), trees (48 species) and shrubs (46 species) (Figure 2). The most frequently used plant parts in the preparation of herbal remedies were roots (67 species), bark (40 species) and leaf (30 species) (Figure 5).

The most frequently elicited modes of preparation were extract (plant part smashed, crushed, or chopped and juice extracted: 92 species), paste (plant parts smashed, crushed and made paste: 63 species), soup (plant parts boiled: 14 species) and raw (plant part directly used without processing: 14 species) (Figure 3).

There were numerous ethno-medicinal plants used for the treatment of around 48 disorders in the Limbu community. Gastrointestinal treatment had the highest frequency of ethno-medicinal use (52 species). Cuts, burns and some other wounds were treated with 40 species and osteological disorders with 30 species. All the 48 disorders, regrouped into 15 on the basis of nature and physiology of disorders are given in Figure 6. In the Limbu community, Limbu healers (*Phedangma*), who are the ethno-medicine practitioners, also recite some magical words called "*mantra*" (in Nepali) during the treatment. It is considered that the use of the mantra increases the healing power of the herbal medicine and the treatment becomes more effective.

The most frequently used modes of administration of medicinal preparations were oral (112 species) and topical (62 species) (Figure 4). Oral and topical modes of administration were preferred because they were the easiest and the most effective in delivering bioactive compounds into the body.

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The plants described herein have tremendous ethno-medicinal significance. Their use in ethno-medicine has evolved largely by hit and trial process and some of these have very well stood the test of time. However, most of these plants are yet to be experimentally verified for their medicinal value. That is, the antibiotic-, bioactive-, and other properties of herbal medicine used by ethnic people needs to be tested. In other parts of the world, pharmaceutical industries have been continuously exploring new medicinal plant species and the associated traditional medicinal knowledge of the ethnic communities there. It can be surmised that many pharmaceutical industries may still be exploiting the IK (Indigenous knowledge) of the IPs (Indigenous Peoples) without any equitable benefit sharing mechanism. But such uses and practices are poorly documented. It is therefore important to document such uses and practices not only for enhancing conservation efforts but also for protecting IK erosion as well as misappropriation.

Limbu communities in the study area were found to be knowledgeable regarding the use of plants for various illnesses and ailments. A total of 225 species of ethno-medicinal plants of the Limbu community is reported in this work while the number of Limbu ethno-medicinal plants in the past reports are far below, e.g. 119 species (Limbu, 2008), 99 species (Maden et al, 2007) and 76 species (Siwakoti, 1998). The level of the Limbu cultural knowledge (as measured by the number of species interactions) may be compared to other ethnic groups living in similar environments in Nepal. For example, ethno-medicinal plants were reported to be of 119 species in the Newar community (Balami, 2004), 85 species in Magar (Magar, 2012), 85 species in Rai and 105 species in Yakkha (Maden et al, 2007). This shows that the Limbu community has far greater knowledge on ethno-medicinal practices as compared to other ethnic communities in Nepal. It must be noted that the Rai, Limbu and Yakkha communities are much closer to each other in term of kinship and settlement, as a result of which they share their indigenous knowledge and practices and some medicinal plants are common to them all.

IV. Treatment Process

In order to treat people, Limbu priests and shamans have developed various treatment methodologies depending on the nature of diseases and illness. These treatment processes have been developed through long time efforts which involved hit and trial practices and are now considered approved. They use different parts of plant in various forms, i.e. paste, extraction, decoction and raw, for treatment.

We have attempted to present responses to the use of different plants or their parts for the treatment of diseases. They are as follows:

Stomachache - A few respondents said that they used the fruit part of *chimphing* (*Heracleum wallichii*,). Most of the respondents said that they resorted to *dhami-jhankri* (witch-doctor). The knowledge gap in the treatment of stomachache is explicable because stomachache results from various reasons and no single medication is applicable to all cases. Under such circumstances, the trial-and-error method used by the natives cannot be expected to produce the results that can be easily generalized.

Fever - Most informants said that they use the infusion of ***chiraito*** (*Swertia chirayita*). This treatment is effective against headache also. This finding suggests that there exists a void in the transmission/dissemination of traditional knowledge. People seemed to relate persistent bitterness of plants to cure fever. This plant contains several bitter compounds like ophelic acid, chiratin (glucoside), amarogentin (glucoside), and swerchirin as the active component (Anon, 2002). In Nepal, this plant (unprocessed) is used for the treatment of fever and malaria (Anon, 2006).

Fracture - A number of items were named by the respondents for the treatment of fracture, viz. bark of ***mahuwa*** /***mauwa*** (*Engelhardia spicata*), honey, eggs, milk, mistletoe or ***hadchoor*** (*Viscum album*), ***pakhanbhed*** (*Bergenia ciliata*), horsetail or '***sallibisalli'/ghodpuchre*** (*Equisetum sp.*), ***bhuinchampa*** (*Kaempferia rotunda*), bark, and snails. Information on active ingredients from some of the above plants is available. ***Sallibisalli*** is known to contain salicic acid, nicotine, palustrine, palustridine, sterols and malic acid. These ingredients have antimicrobial, antiseptic, and anti-inflamatory effects. Traditional uses of the ***hadchoor*** bark have been mentioned by various authors (e.g. Widmann et al., 2003; Bishokarma et al., 2001), but details on its chemical composition and active ingredients are not available.

Dental problem (Tootache) - All the interviewees named clove oil and the oil of ***timur*** (*Zanthoxylum armatum)* as the most effective medicine. Other options included the latex from ***saruwa kadam*** (*Jatropha curcas*), extracts from the rhizome of ***kaalo unyu*** (*Tectaria macrodonta*), ***pire jhaar*** (*Spilanthes acmella*), ***tulasi*** (*Osimum sanctum*), and guava bark. Some informants mentioned of *tantrik* (one who castes spells) treatment also. Traditionally, it is believed that toothache is due to worms and the latter can be removed by a combination of ***tantrik*** method and herbal medication.

Epistaxis (nosebleed) - This condition occurs occasionally and there are several reasons for leading to this condition. Minor irritation and rupture of small veins of the septum of the nose are the main reasons. These veins may rupture spontaneously, or the rupture may be caused by a cough or sneeze that raises the blood

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pressure inside the veins of the nose. People drop extracts from *dubo* (*Cynodon dactylon*) or *titepati* (*Artemisia indica*) into the nostrils for stopping the nosebleed. It is common to plug the nostrils with rolled leaves of *titepati* to clot the blood. Some informants mentioned that they rub soot from the mud (or stone) tripod of traditional firewood stove on the forehead. The details of reactions that may/may not take place when plant extracts are administered are a subject of further study (except that they have proven antiseptic property) but the use of soot appears to have a psychological role.

Scabies - Scabies is a contagious skin disease caused by itch mite (*Sacroptes scabiei)*. The disease is characterized by intense itching. To counteract this itching, people resort to different herbal medicines People use the juice squeezed from *titepati* (*Artemisia indica*), *bojho* (*Acorus calamus*), or *angeri* (*Lyonia ovalifolia*) shoots. *Angeri* is a very potent medicine but it gives an intense burning sensation. For the sensitive ones, treatment with *angeri* can be very agonizing and therefore care must be taken during its administration. According to some people, *angeri* is simply an absolute medicine for scabies. Modern treatments of scabies involve topical application of lotions containing permethrin and lindane.

Burns - Many natives have heard about the use of *ghiu kumari* (*Aloe vera*), and some of them use it. *Babari* (*Ocimum basilicum*) juice, *harro* (*Terminalia chebula*) oil, *ghoda khori* (*Lyonia ovalifolia*) oil and *saruwa kadam* (*Jatropha curcas*) sap are also used. As to *Aloe vera*, the use of it is also prevalent in other regions of Nepal and it appears that the practice is not indigenous to the study site. These medicines may have chemicals the topical application of which may lessen the pain or hasten the healing but this needs further study to validate it.

Jaundice - Jaundice results from various conditions, but all of them stem from the health of the liver. The patients are encouraged to drink black sugarcane juice and eat a lot of papaya. This is justifiable because the liver is weak, and easily assimilable forms of foods are needed under these conditions. The 'functional ingredients' found in these foods may well play complex and synergistic role in speeding up the recovery. Besides diet regimen, they also administer the juice of *amarlata* (*Cuscuta reflexa*) and aqueous extracts of *ban ghiraula* (*Trichosanthes cucumerina*) as modest doses.

Amarlata is a yellow-colored epiphytic plant that finds an important place in *ayurveda*. It is used in bilious disorders (Chopra, 1986), protracted fever, and also as a purgative (Chopra, 1986; Manandhar, 2002). The use of this plant in the treatment of jaundice may have relation to the sensory property of this plant, namely its golden color. Recently, Ali (2004) has carried out a very extensive study on the components of *amarlata*, in which 26 components were isolated. The author has also discussed the anticancer properties of some of these components.

According to Chadha (1976), the root of *ban ghiraula* is used as a cure for bronchitis, headache, and boils. Both the root and fruit are considered cathartic. Leaves are used in biliousness.

Dysentery - The natives use **pakhandbhed** (*Bergenia ciliata*), **lalchan** or **belchanda** (*Hibiscus sabdariffa*), guava barks/leaves, and rhizomes of **kaalo unyu / kaalo nigure** (*Tectaria macrodonta*). The oral administration of the above-mentioned herbs may have actions similar to antibiotics that are used to combat dysentery. **Lalchan** can be eaten as such but the rhizomes of **kaalo nigure** are first rubbed on a stone with some water and the slurry that results is taken orally.

Among other things, ***belchanda*** contains gossypetin, hibiscin, anthocyanins, pectic substances, vitamin C and many other organic acids.

Recent researches show that guava contains more than 20 identified components. Its leaves contain β-selinene, guajavarin, quercetin (and a number of flavonoids), to name but a few. Reports validate that guava leaf and bark extracts can be effective against hypertension and diarrhea (Belemtougri, 2006).

Tonsillitis - Tonsillitis, incorrectly called 'tonsil' by the natives, is the inflammation of tonsils of the mouth, caused by either bacteria or virus. The natives believe that chewing a corn seed is beneficial for tonsil. ***Abhijaalo*** (Limbu name: ***wana***) (*Drymaria cordata*) can also be chewed to soothe the pain. These medicines most probably work by destroying/inhibiting the causative organisms, much like the antibiotics used in allopathic treatment.

Ding et al (2005) have discussed the presence of 3 cyclic peptides and 4 flavone glucosides (drymareatin A, B, C, and D) in the ***abhijaalo*** plant. The plant is also used by the Chinese in the treatment of acute hepatitis (Ding et al., 2005).

Sinusitis - Sinusitis is a skull disease that occurs due to inflammation (caused by bacterial infection) of the membrane lining a sinus of the skull. A plant called ***haachhyun jhaar*** (*Dichrocephala integrifolia*) is very popular but this is not a permanent remedy. The plant induces sneezing, which temporarily relieves the condition. Some people also said that they administer the juice of ***ban ghiraula*** (*Trichosanthes cucumerina*) through the nostrils. Hot salt water was reported to stabilize the complication.

Boils/Abscess - In the survey, it was found that people deliberately made boils more septic by topically applying ***murcha*** (Yeast cake), etc. Sometimes, a kind of paste prepared from ***amliso*** (*Thysanolina maxima*) roots is also used. Bringing about septic condition fills the boils with pus and can be easily squeezed out.

Piles - A few people mentioned the use of ***harro*** (*Terminalia chebula*) for the treatment of piles. Since this

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method is hardly used by the people, it does not appear sensible to direct research in it.

Harro seeds are extensively as a medicine. The seed flesh is rich in tannin (mainly chebulagic acid, chebulinic acid, and corilagin). The fruit is credited with laxative, stomachic, tonic, and alterative properties.

Snake bite - People use black *bikhma* (*Aconitum spicatum* syn *bisma*) as the primary aid. Biting garlic (*Allium wallichi*) and sucking poison out of blood from the wound is a very effective first aid. Garlic and *bikhma* may be effective as an antitoxin (though not exactly like an anti-snake venom serum, ASVS). The tying of upstream part with a flexible cord is very logical as it delays the spread of toxin.

Bikhma contains five diterpene alkaloids: palmatiscine, vakognavine, vakatisine, vakatisinine, and vakatidine. It can be externally used for rheumatism and cuts or wounds (Chadha, 1976). Aconitine is easily absorbed through skin and poisoning may occur through this route simply by picking the leaves. Therefore, care must be taken in identifying the correct plant.

Worms - Aqueous extracts of firewood ash is usually used to kill worms. Many people also use lemon juice. Some people use root extracts of *siru* (*Imperata cylindrica*), *amliso* (*Thysanolina maxima*), *sallibisalli* (*Equisetum sp.*), *bhirgaule* (*Coix lachrymajobi*), and *ulte kuro* (*Achyranthes aspera*). The roots are rubbed on a stone and the aqueous dispersion are orally administered. Some people mentioned using the fruit decoction of *lapsi* (*Choerospondias axillaris*). It is known that rhizomes of *siru* contain, inter alia, appreciable amounts of dimethylsulfopropionate and potassium. Elsewhere, a *siru* extract is combined with other herbs to prepare liver cleansing medicines. It has antibacterial-, diuretic-, febrifuge-, and anthelmintic properties (Yeung, 1985; Manandhar, 2002).

Fresh wounds/Cuts - People topically apply extracts or juices of *kaali jhaar* (*Eupatorium odoratum*), *titepati* (*Artemisia indica*) and certain lichens. Some people also topically apply trichome of *dhusure* (*Colebrookea oppositifolia*). The above plants extracts obviously work as disinfectant. Some may also work as pain reliever. Some informants were found to use tender shoots of *thaade unyu* (*Thelypteris appendiculoides*) and rhizomes or leaves of *chiple* (*Pouzolzia hirta*).

Elsewhere, rhizomes of *Zingiber cassumunar* are used for curing nausea and headache. A small piece of rhizome may be chewed and swallowed or paste topically applied for the treatment of the same. The plant is believed to ward off evil spirits and repel snakes.

Muscle Sprain - Muscle sprain is treated by applying paste of *chitu* (*Plumbago zeylanica*) roots. Some people also use *aankh* (*Calotropis gigantea*) leaves. The leaves are baked on fire or under hot cinders and pressed over the sprain while still hot (the heat may sometimes become unbearable). The process is repeated for a number of times. People also said that they use *ghoda khori* (*Viburnum cylindricum*) oil and 'rifle oil' (whenever available) ~~to~~, which they rub over the sprain. This massaging relieves one of pain and speeds up healing.

Several uses of *aankh* have been mentioned in the Wealth of India (Chadha, 1976). The root bark contains α-amyrin, β-amyrin, taraxasterol, gigantin, giganteol, etc. The latex gives cardiac glycosides, calotropin, uscharin, calotoxin, colactin and uscharin. The calotropin and calotropain comlponent of the latex have anti-inflamatory and anthelmintic properties. Warmed leaves are bandaged to soothe swellings and sprains.

The traditional use of *ghoda khori* oil for rubbing against pain and backache has been mentioned by Chadha (1976) and (Widmann et al., 2003).

Rabies dog bite – The bark of the *kaphal* (*Myrica esculenta*) tree or the stinging nettle or '*sisnu'* (*Urtica dioica*) root is ground into paste and applied over the affected area. A small amount of the paste is also administered orally. Some people mentioned the use of *bikhma* (*Aconitum spicatum*) and root extracts of *kaali jhaar* (*Eupatorium odoratum*).

According to Chadha (1976), the *kaphal* bark is astringent, carminative and antiseptic. A decoction of the bark is useful in asthma, diarrhea, fever, etc. The bark is rich in tannins. The fruit part is eaten. The active components of the botanicals mentioned above have been described earlier.

Sore throat - People eat corn seeds, pumpkin seeds, and *laligurans* (*Rhododendrom arboreum*) flowers to relieve sore throat. Rhododendron has been shown to possess antiviral properties by Rajbhandari et al (2007). *Rhododendron lepidotum* flower in particular is effective against fever, cough, cold and tonsillitis. *Rhododendron arboreum* is used in the preparation of a kind of snuff. Tender leaves are stated to be used as a vegetable, and also applied to the forehead to relieve headache. Green leaves contain a glucoside called ericolin (Bhattarai et al, 2010). Eating flowers in large amounts causes intoxication. Petals can be used for the treatment of diarrhea and dysentery (Chadha, 1976).

Constipation – In the sites where we conducted our research, constipation occurs only occasionally, in which case they suck the black coatings of the *rajbrikhsa* (*Casssia fistula*) seed. Since this *rajbriksha* treatment is popular among other people also, it is difficult to say when and from where the practice began. Some people mentioned *indreni* (*Trichosanthes tricuspidata*) roots, chewed in modest amounts, are very effective against constipation. A great deal of literatures is available on *Cassia fistula*. An extensive review by Bahorun et al (2005) shows that this plant contains potent phenolic antioxidants such as anthraquinones, flavonoids and flavanol derivatives. *Rajbriksha* is used

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has purgative, antipyretic, analgesic and antibacterial properties. It is also widely used in the treatment of stomach disorder.

Rash due to allergy – The Limbu people believe in a very peculiar treatment method. '**Puwalo mala**' (a type of beaded necklace) is rubbed against the rashes, which is later pressed with '***janto***' (a hand operated attrition mill made from a pair of circular stone; used to pulverize grain seeds). Another very effective treatment is to rub ***phachyang*** (*Zingiber cassumunar*) over the affected area. This plant also supposedly wards off evil spirits.

Common cold - People drink in modest amounts the un-boiled aqueous extract of ***titepati***. This medication is also helpful in pneumonia. Some people drink a lot of heavily-seasoned, hot chicken soup to drive away the cold. It is a general belief that fried (sizzled in a small amount of oil) ***raksi*** can also relieve cold. It is also common to chew ginger rhizomes (hot, baked under cinders) to counteract the irritation in throat and relieve the coughing. Albeit less commonly ***lasun*** (*Allium wallichi)* and ***gurans*** (*Rhododendron lepidotum*) are also eaten in modest amounts to get relief from common cold.

Diarrhea - In the study sites, immature banana and guava are considered beneficial to the treatment of diarrhea. Bark extracts of ***jamuna*** (*Syzygium cumini*), ***gayo*** (*Bridelia retusa*), and ***ambak*** (*Psidium guajava*); fruit extracts of ***totala*** (*Oroxylum indicum*) and tender bud extracts of ***ainselu*** (*Rubus ellipticus*) were also mentioned as having antidiarrheal properties. Although they are familiar as home-based electrolytic treatments such as '***nun-chini-pani'*** (salt-sugar-water) and '***jivan jal'*** against dehydration, as anyone knows, these are not their discoveries. People were found to believe that an immature banana owes its medicinal property to alkaline taste. Guava is supposed to cure diarrhea because of its profuse seeds (which help harden the stool!).

The above results and discussions are based on the emic perspective. Pharmacological analysis to test the efficacy of plant-based treatments is very difficult. Pharmacological data, especially screenings for the bioactivity of phytochemicals, to determine the relative efficacies of medicinal plants appears logical but is rather involved.

The frequency at which a given illness occurs in a rural setting is rather difficult to assess because people tend to forget the episodes unless they are very important. Here, an attempt was made to determine the frequencies of the illnesses by counting the frequency of a particular word in the text. Based on this method, following results (Table 1) were obtained. The ranking of illness (1 = highest incidence, 7 = lowest incidence) in Table 1 is in general explicable. Agriculture in the hills is obviously very difficult. It involves a lot of physical work, often in jungles, among thorny bushes, and eerily steep slopes. In fact, there isn't a day without cuts and wounds. The higher incidence of fracture is justifiable for the same reason.

Other illnesses in the list relate mostly to lack of sanitation and faulty food habit. This in turn will lead to food insecurity, malnutrition and hence the vicious cycle. Improvement in the food habit and sanitation can have a significant effect in the lives of these people.

The survey data shows that some of the traditional methods of treatments have rather questionable or dubious status, the treatments used for piles, snake bite, jaundice, and rabies in particular. Incidences of diseases such as food poisoning, toothache, constipation, worms, etc., can be reduced by several simple and effective measures such as sanitation, personal hygiene, and improved eating habits.

V. Conclusions

The mountain dwelling indigenous Limbu people have identified a total 225 species of ethno-medicinal plants for the treatment of around 48 disorders in their community. The problems they often face are gastrointestinal and Cut-Wound-Burn (CWB) in their daily life. Thus, for the resolution of frequent problems, the Limbu investigated more ethno-medicinal plants in this respect, i. e. 52 species for gastrointestinal and 40 species for Cut-Wound-Burn (CWB). Limbu healers (***Phedangma***), who have special knowledge about ethno-medicine, are ethno-medicine practitioners. They also recite some words "***mantra***" during the treatment. It is considered that such treatment process is more effective. They prefer to use high altitudinal medicinal plants, namely *Aconitum spicatum* ***(Bikhma)***, *Astilbe rivularis* ***(Budho Okhati)***, *Bergenia ciliate* ***(Pakhanveda),*** *Euodia fraxinifolia* ***(Siltimur),*** *Heracleum nepalense* ***(Chimphing)***, *Nardostachys grandiflora* ***(Jatamasi)*** and *Swertia chirayita* ***(Chiraito)*** because they consider that these medicinal plants have high efficacy in treatment. The ethno-medicinal knowledge ~~in~~ of the Limbu community is gradually eroding due to western modern pharmacology, easy access of modern medicines, and general disinterest among younger generations in particular.

VI. Acknowledgements

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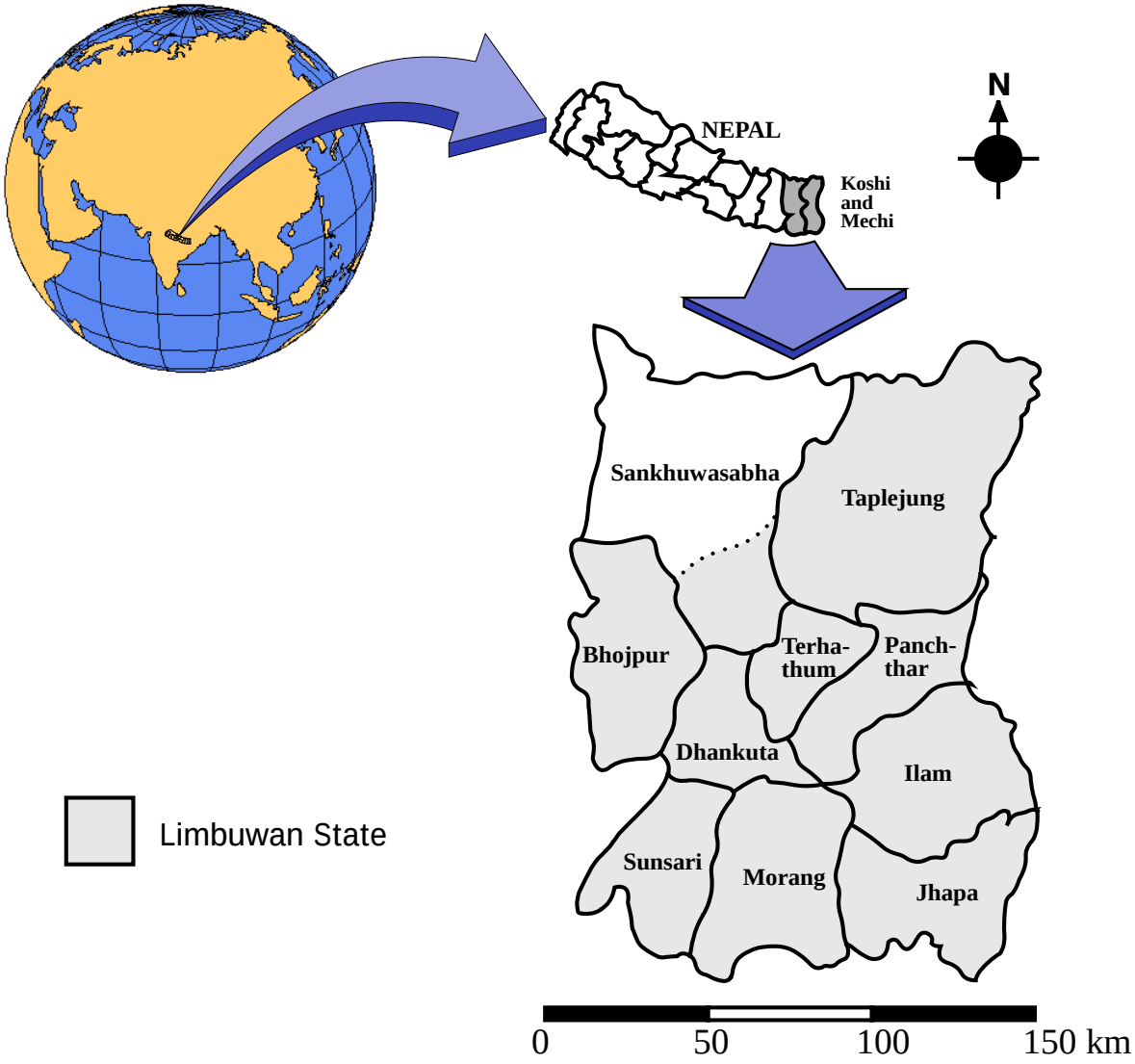


Figure 1 : Map of the study area(Limbuwan)

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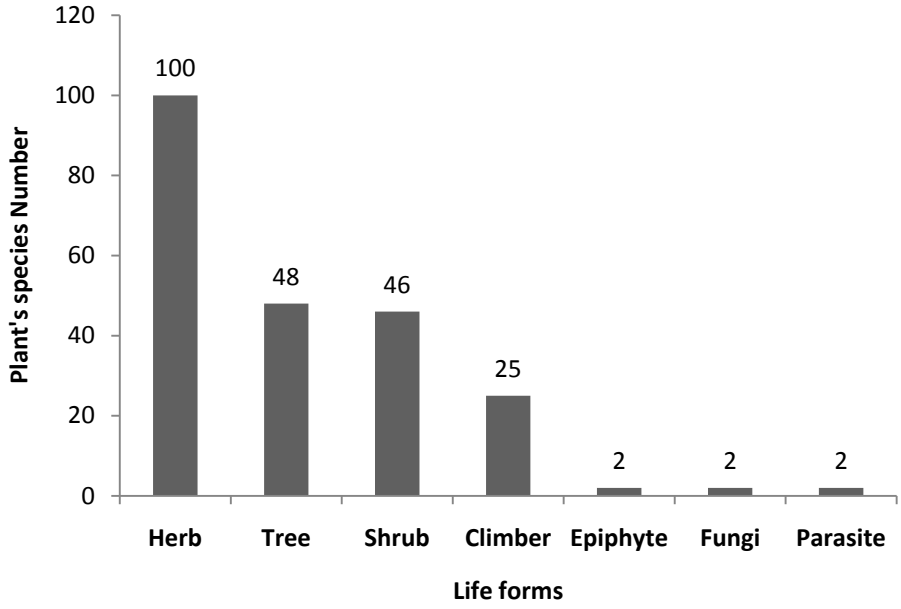


Figure 2 : Habit of Medicinal Plants

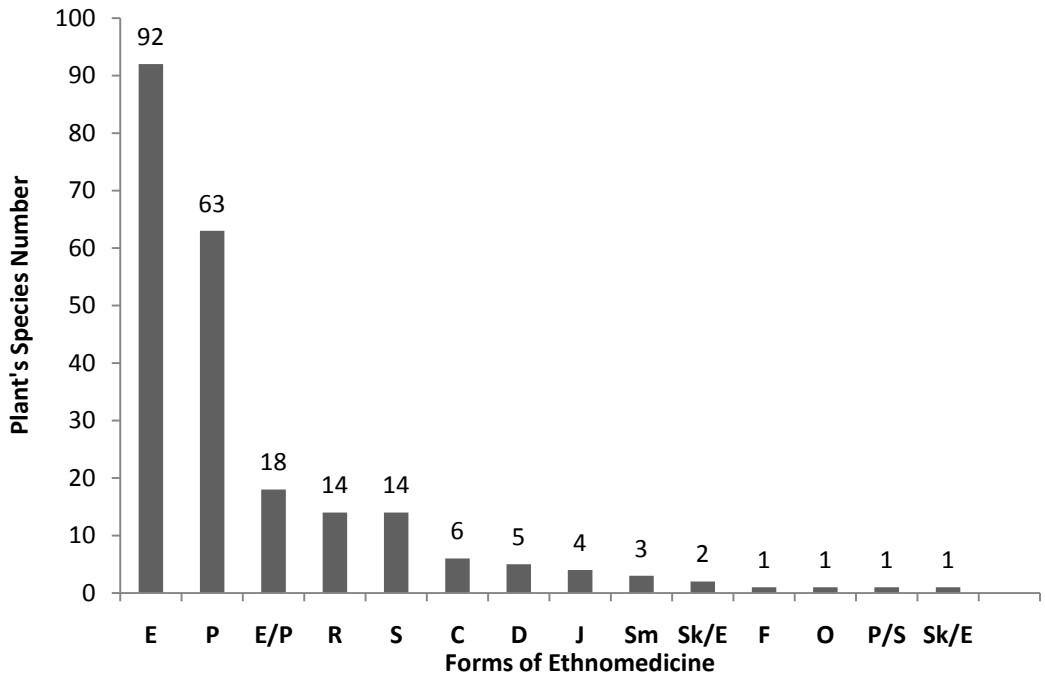


Figure 3 : Different forms of medicinal plant used; Notation, E-Extract, P-Paste, C-Chewed, S- Soup, Co-cooked, J-Juice, Sm- Smelled, F-Fried, Sk-Smoke, O-Oil

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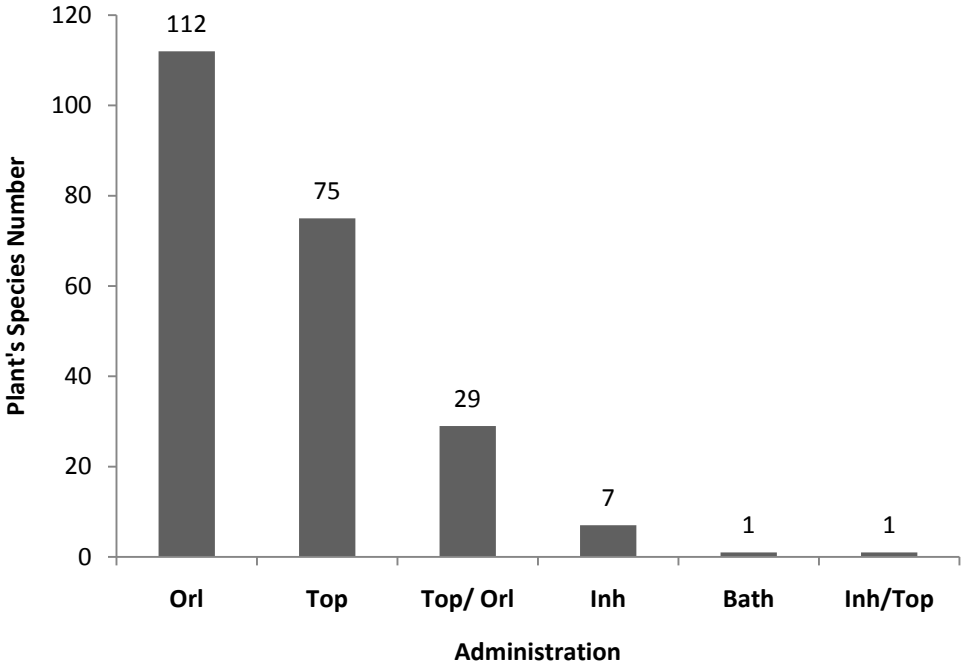


Figure 4 : Administration of ethnomedicine; Notation, Orl-Oral, Top-Topical, Inh- Inhalation

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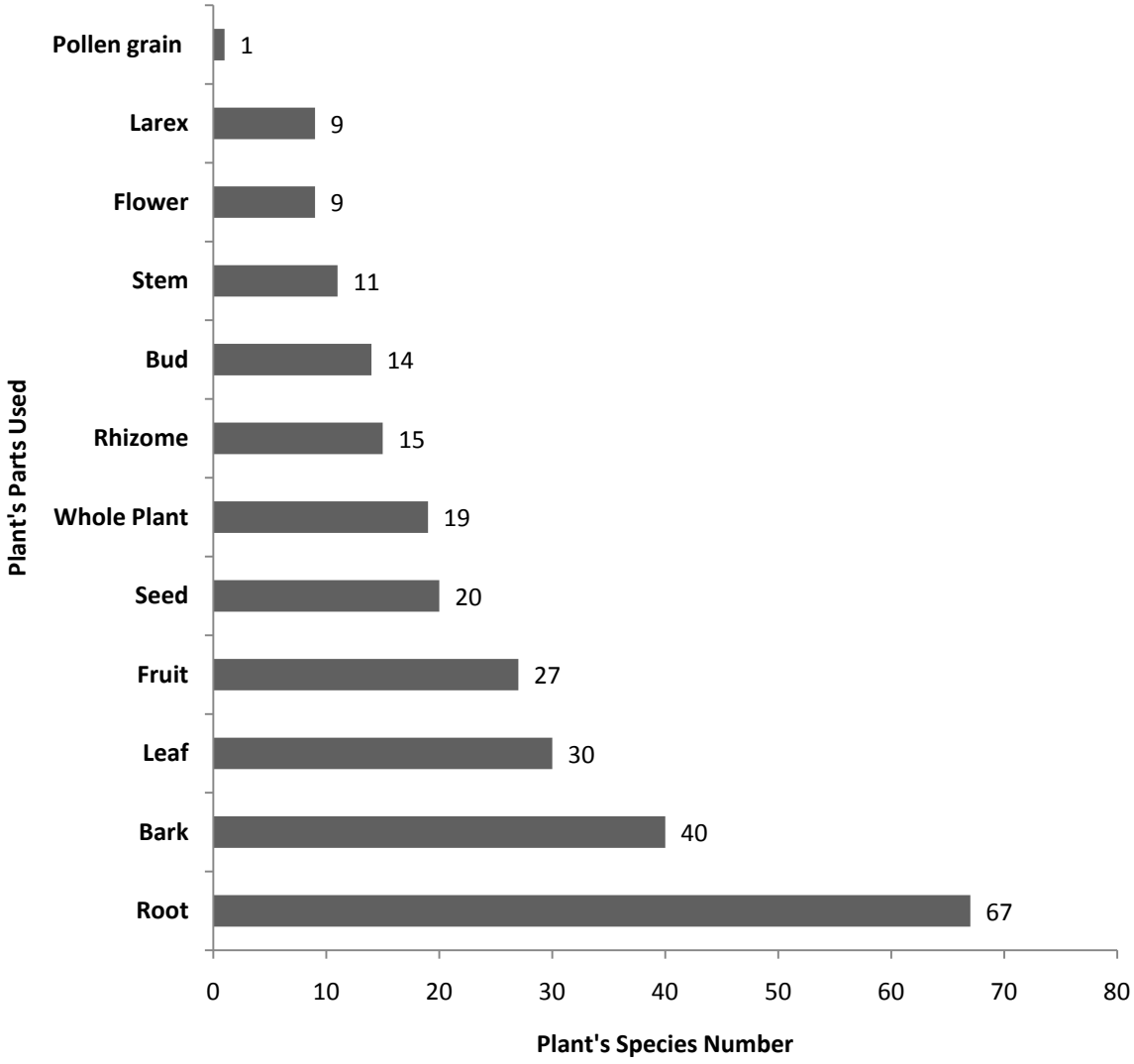


Figure 5 : Plant's parts used for ethnomedicine

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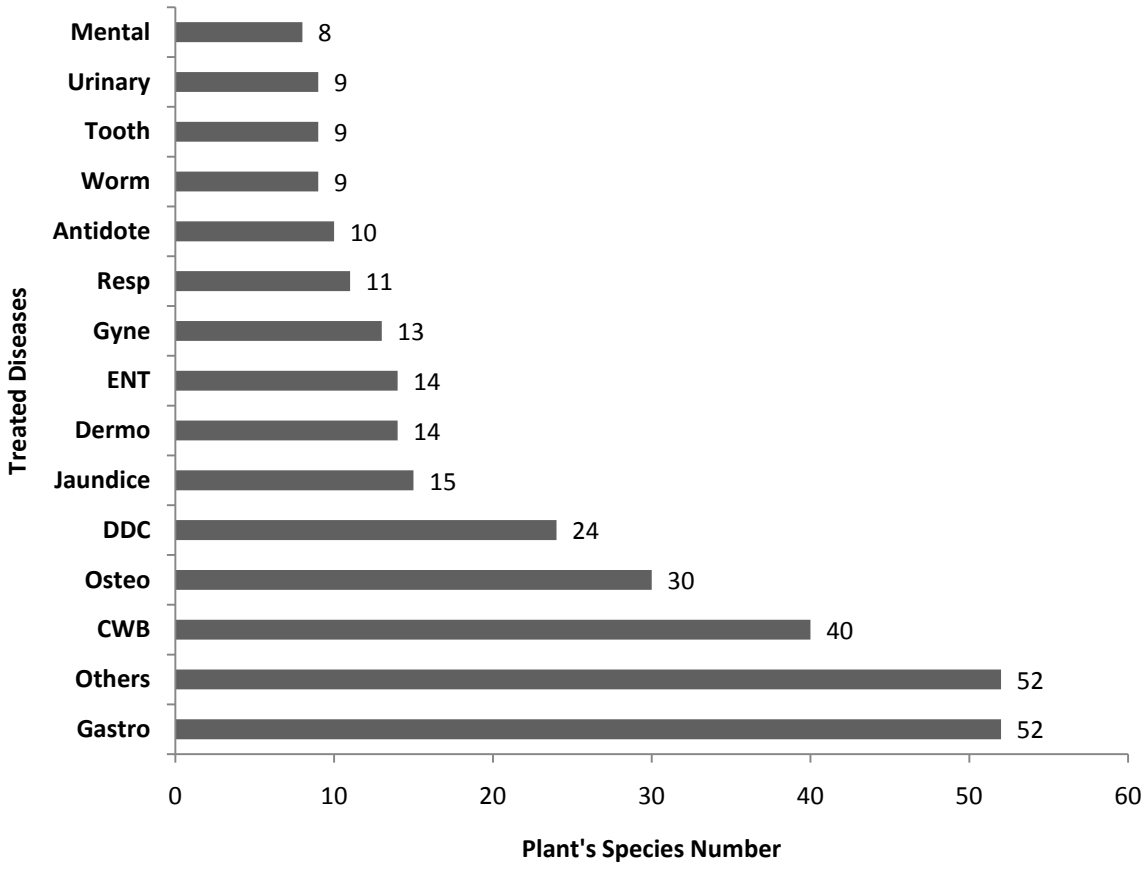


Figure 6 : Different nature of disorders treated by ethnomedicine

Notations:
Gastro =Gastritis, Laxative, Lithontripic, Piles, Stomachache
Others=Aphrodiasic, Appetizer, Body massage, Blood pressure, Flu, Diabetes, Fever, Headache, Heart diseases, Measles, Eye problem, Rabies, Rheumatism
CWB = Cut, Wound, Burn
Osteo = Dislocated joint, Fracture
DDC = Diarrhea, Dysentery, Cholera, Food poisoning
Jaundice = Jaundice
Dermo = Dandruff, Ring worm, Scabies and skin problem
ENT = Ear problem, Sinusitis, Throat sore, Tonsillitis
Gyne = Abortion, Menstruation,
Resp = Asthma, Pneumonia
Antidote = Antidote
Worm = Worm
Tooth = Tooth
Urinary = Diuretic, Hydrocele
Mental = Epilepsy, Addiction

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Table and Appendix

Table 1 : Occurrence of illness term in the text

Illness	Frequency in text	Rank
Cuts and wounds	35-40	1
Fracture	30-35	2
Diarrhea	25-30	3
Worms / helminthes	20-25	4
Piles and jaundice	15-20	5
Sinusitis, scabies, tooth ache, fever, and sore throat	10-15	6
Dysentery, sprains, dog bites, stomachache, boils/abscess, tonsillitis, snake bite, and constipation	5-10	7

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Appendix – Summary of information on traditional uses of plants of Limbu community
Notation: Adm. = Administration; O = Oral; T = Topical; B = Bath; I = Inhalation; E = Extract; P = Paste; C = Chewed; D=Dust; R=Raw; S = Soup; J = Juice; Sm = Smelled; F = Fried; Sk = Smoked; O = Oil.

Scientific name	Vernacular name	Limbu name	Family	Adm.	Part used	Form	Used as treatments
Abrus precatorius L.	Lalgedi	**Mitchhesing**	Fabaceae	O	Fruit/ Root	E	Abortion
Achyranthes aspera L.	Ulte kuro	**Aple**	Amaranthaceae	O	Root	E	Pneumonia/ Worm
Achyranthes bidentata Blume	Dattiwan	**Kandrekpa**	Amaranthaceae	O/T	Root	E/P	Pneumonia/Wound
Aconitum ferox Wall. Ex Ser.	Seto bikhma	**Wasing kuphara**	Ranunculaceae	O	Rhizome	C	Headache/Stomachache
Aconitum sp.	Phalebis	**Ning**	Ranunculaceae	O	Root	E	Asthma
Aconitum spicatum (Bruhl) Stapf	Bikhmaa	**Masing**	Ranunculaceae	T	Rhizome	P	Rabies/Stomachache
Acorus calamus L.	Bojho	**Sedakpa**	Acoraceae	B	Rhizome	E	Scabies/Sinusitis
Justicia adhatoda L.	Asuro	**Sikchakwa**	Acanthaceae	O	Root	E	Cholera/Epilepsy
Aegle marmelos (L.) Correa	Bel	**Anjamse**	Rutaceae	O	Seed	E	Ulcer
Aesandra butyracea (Roxb.) Baehni	Chiuri	**Imsewa**	Sapotaceae	T	Bark /Seed	P	Fracture/Piles
Ageratum conyzoides (L.) L.	Ilamejhar	**Isayak**	Asteraceae	T	whole plant	E	Antidote
Albizia julibrissin Durazz.	Padke siris	**Yephekpa**	Fabaceae	T	Bark	P/E	Dandruff
Allium cepa L.	Lasun	**Makkho**	Liliaceae	O	Bud	R	Blood pressure/Laxative
Allium wallichii kuntn	Ban lasun	**Sam-makkho**	Alliaceae	T	Bulb	P	Cut/Wound
Aloe vera (L.) Burm. f.	Ghiukumari	**Lupse**	Liliaceae	T	Leaf	E	Burnt
Alpinia allughas (Retz.) Roscoe	Churampha	**Challewa**	Zingiberaceae	O	Root/Rhizome	E	Diabetes/Laxative
Alstonia scholaris (L.) R. Br.	Chhatiwan	**Phakluppa**	Apocynaceae	T	Bark	E	Piles
Amaranthus spinosus L.	Lunde	**China mangra**	Amaranthaceae	O	Root	E	Diuretic
Amomum subulatum Roxb.	Alainchi	**Arengi**	Zingiberaceae	T/ O	Seed	E	Burnt/Diuretic
Anaphalis triplinervis (Sims) C. B. Clarke	Bhukiphul	**Sirogak**	Asteraceae	T	Flower	P	Skin problem

Araucaria bidwillii Hook.	Dhengresalla	**Songmang sing**	Araucariaceae	O	Bark	E	Ulcer
Arisaema flavum (Forssk.) Schott	Sarpa jibre	**Osek maki**	Araceae	O	Leaf petiole	E	Epilepsy
Artemisia indica Willd.	Titepati	**Namyoba**	Asteraceae	T/ O	Bud/Leaf/Root	E	Epistaxis/Gastric/Rheumatic
Artocarpus lakoocha Wall. Ex Roxb.	Badahar	**Muchhe**	Moraceae	T/ O	Bark/Latex	E	Diarrhea/Wound
Arundinella nepalensis Trin.	Kharuki	**Kendan**	Poaceae	T	Root	P	Wound
Asparagus racemosus Wall.	Kurilo	**Nakkhamma**	Liliaceae	O	Root	E	Gastric
Astilbe rivularis Buch.-ham. ex D. Don	Bhudo okhati	**Sawanyamden**	Saxifragaceae	O	Root	C	Cough and flu
Melia azadirachta L.	Neem	**Khajase**	Meliaceae	O	Leaf	S	Fever/Toothache
Bambusa arundinacea Willd.	Baans	**Pha**	Poaceae	O	Root	E	Jaundice
Bauhinia purpurea L.	Koiraalo	**Ajiba**	Fabaceae	O	Bark	E	Lithontripic
Bauhinia vahlii Wight & Am.	Bhorla	**Makka**	Fabaceae	O	Root	E	Menstruation problem
Benincasa hispida (Thunb.) Cogn.	Kubindo	**Phutrama**	Cucurbitaceae	O	Seed	E	Abortion
Berberis aristata DC.	Chutro	**Lakpuche**	Berberidaceae	O	Root	E	Jaundice/Menstruation problem/Piles
Bergenia ciliate (Haw.) Sternb	Pakhanbhed	**Yakpegma**	Saxifragaceae	T/ O	Root	P/E	Fracture/Throat sore/ Uterus problem
Bidens pilosa L.	Philungekuro	**Apli**	Asteraceae	T/ O	Leaf/ Root	E	Cut/Jaundice
Bischofia javanica Blume	Kaijal	**Mukumba**	Euphorbiaceae	O	Bark	E	Gastric
Bistorta amplexicaulis (D. Don) Greene	Ratnaulo	**Helloke**	Polygonaceae	T	Root	P	Antidote
Boehmeria macrophylla Hornem.	Tungejhar	**Khamturemba**	Urticaceae	T	Whole plant	P	Wound
Bombax ceiba L.	Simal	**Tengo sing**	Bombacaceae	T/ O	Bark/Latex/ Root	P/E	Dysentery/Laxative /Measles
Bridelia retusa (L.) Spreng.	Gaayo	**Yangkhek**	Euphorbiaceae	O	Bark	E	Appetiser/Diarrhea
Calotropis gigantean (L.) Dryand	Aankh	**Aak**	Asclepiadaceae	T	Young Leaf	P	Dislocated joint

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Cannabis sativa L.	Ganja	**Pijyama**	Cannabaceae	O	Leaf	E	Laxative
Capsicum annuum L.	Khorsani	**Machchi**	Solanaceae	T	Fruit	P	Antidote
Carica papaya L.	Mewa	**Phanse**	Caricaceae	O	Fruit	R	Jaundice
Caryota urens L.	Ban supari	**Tambhung Umse**	Arecaceae	O	Fruit	R	Appetiser
Cassia fistula L.	Raajbrikchha	**Samsiring**	Fabaceae	O	Fruit/Seed	R	Diuretic/Laxative
Castanopsis tribuloides (Sm.) A. DC.	Katus	**Sigap**	Fagaceae	T	Bud	P	Scabies
Centella asiatica (L.) Urb.	Ghodtaapre	**Sidasakchi**	Apiaceae	O	whole plant	E	Stomachache/Ulcer
Cheilenthes sp.	Ranikanda	**Hangmsingjek**	Pteridaceae	T	Root	P	Cut
Chenopodium album L.	Bethu	**Sinang**	Chenopodiaceae	O	Seed	Co	Gastric
Choerospondias axillaris (Roxb.) B. L. Burtt & A. W. Hill	Lapsi	**Imbuwa**	Anacardiaceae	O	Fruit	S	Worm
Cinnamomum tamala (Buch.-Ham.) Nees & Eberm.	Dalchini	**Limsap**	Lauraceae	O	Bark	S	Common flu
Cirsium verutum (D.Don) Spreng.	Sungurkaande	**Chingyakma**	Asteraceae	T/ O	Bud/Root	P/E	Antidote/Diuretic
Citrus aurantifolia (Christ.) Swingle	Kagati	**Larimba**	Rutaceae	O	Root	E	Worm
Citrus junos Tanaka.	Kali jyamir	**Sarang**	Rutaceae	O	Fruit	J	Rabies
Citrus medica L.	Bimira	**Saippa**	Rutaceae	O	Fruit's Bark	R	Worm
Clematis buchananiana DC.	Chunsi	**Pipipa**	Cucurbitaceae	O	Root	E	Sinusitis/Stomachache
Coccinia grandis (L.) Voigt.	Ban kakra	**Suwa paet**	Cucurbitaceae	O	Root	E	Piles
Coelogyne fuscescens Lindl.	Sunkhari	**Singjango**	Orchidaceae	T	Rhizome	P	Fracture
Coix lachryma-jobi L.	Bhirgaule	**Phinjiri**	Poaceae	O	Root	E	Placenta discharge/Worm
Colebrookea oppositifolia Sm.	Dhusure	**Lajesing**	Lamiaceae	T	Bud	E	Ophthalmic problem
Cordycep sinensis (Berk.) Sacc.	Yarsagumba	**Yarsagumba**	Clavicipitaceae	O	Whole plant	E	Aphrodiasic
Costus speciosus (Koenig) Sm.	Betlauri	**Worektembo**	Cucurbitaceae	O	Stem	E	Cholera/Diabetes/
Cucumis sativus L.	Kakra	**Paait**	Cucurbitaceae	O	Seed	E	Laxative

Cucurbita pepo L.	Pharsi	**Yakko**	Cucurbitaceae	O	Seed	F	Diuretic
Curcuma angustifolia Roxb.	Besar	**Harandi**	Zingiberaceae	O	Rhizome	P	Common flu
Curcuma longa L.	Kalobesar	**Kumakla harandi**	Zingiberaceae	O	Rhizome	E	Piles
Cuscuta reflexa Roxb.	Amarlataa	**Chimchimpona**	Convolvulaceae	O	Whole plant	E	Jaundice
Cynodon dactylon (L.) Pers.	Dubo	**Sambok**	Poaceae	T/ O	Root	P	Antidote/Diabetes
Cyperus rotundus L.	Mothe	**Mo**	Cyperaceae	O	Rhizome	E	Sinusitis/Ulcer
Dactylorhiza hatagirea (D. Don) Soo	Paanch aunle	**Tigem**	Orchidaceae	T/ O	Rhizome	P/E	Aphrodiasic/Cut/Epilepsy
Datura metel L.	Kalo dhaturo	**Alando**	Solanaceae	T	Leaf/ Seed	E/P	Dislocated joint/Rabies
Datura suaveolens Humb. & Bonpl. Ex Willd.	Dhokrephul	**Wagowa**	Solanaceae	O	Root	E	Laxative/Placenta discharge
Dichrocephala integrifolia L.f.) Kuntze	Hachheu jhar	-	Asteraceae	T	Whole plant	P	Antidote
Didymocarpus villosus D. Don.	Kumkum	**Sange**	Gesneriaceae	I	Leaf	Sm	Laxative
Dioscorea bulbifera L.	Ban tarul	**Tamphung khe**	Dioscoreaceae	T	Stem	P	Piles
Dioscorea deltoidea Wall. Ex Griseb.	Bhyaakur/Gittha	**Sukhe**	Dioscoreaceae	T	Root	P	Wound
Dolichos biflorus L.	Gahat	**Phekluse**	Fabaceae	O	Seed	S	Lithontripic/Measles
Lablab purpureus (L.) Sweet.	Tate simi	**Khesekpa**	Fabaceae	O	Root	E	Abortion/Epilepsy
Drymaria cordata (L.) Willd. ex Schult.	Abhijaalo	**Wana**	Caryophyllaceae	T	Whole plant	P	Antidote/Pneumonia,
Elaeagnus parvifolia Wall. ex Royle	Guelo	**Kharmakpa**	Elaeagnaceae	O	Bark	E	Diarrhea
Engelhardia spicata Lechen ex Blume	Mahuwa	**Yakpapma**	Juglandaceae	T	Bark	P	Fracture
Entada phaseoloides (L.) Merr.	Paangraa	**Neghek**	Fabaceae	T	Fruit	P	Fracture
Equisetum arvense L.	Sallibisalli	**Hondok**	Equisetaceae	O	Root	E	Diuretic/Worm
Erythrina stricta Roxb.	Phaledo	**Manglok**	Fabaceae	O	Stem	R	Toothache
Eulaliopsis binata (Retz.) C.E.Hubb.	Babiyo	**Igekling**	Poaceae	T	whole plant	D	Skin allergy
Euodia fraxinifolia (D. Don) Hook. f.	Khanakpa	**Khanakpa**	Rutaceae	O	Fruit	E	Cholera/Food poison,

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Eupatorium adenophorum Spreng.	Kaali jhaar	**Makyamma**	Asteraceae	T	Leaf/Root	E	Cut/Sinusitis
Eupatorium sp.	Mikchiriphung	**Mikchiriphung**	Asteraceae	O	Root	E	Placenta discharging
Euphorbia royleana Boiss.	Kandesiudi	**Lungdinwa**	Euphorbiaceae	O	Latex	R	Appetiser
Fagopyrum esculentum Moench.	Titephapar	**Kyabo**	Polygonaceae	O	Young plant	S	Heart disease
Ficus benghalensis L.	Bar	**Labhaksing**	Moraceae	O	Root	P	Gastric
Ficus lacor Bunch-Ham.	Kabra	**Khaitrang**	Moraceae	T	Latex	R	Wound
Ficus religiosa L.	Pipal	**Namsusing**	Moraceae	T/ O	Bark/Leaf	E/P	Dysentery/Wound
Ficus semicordata Buch.-Ham. ex Sm.	Khanyu	**Khagse**	Moraceae	T	Bud/ Latex	E	Pneumonia/Wound
Fraxinus floribunda Wall.	Lakuri	**Pidjuma**	Moraceae	T	Bark	P	Fracture
Fuchsia hybrid Hort. Ex Siebold & Voss	Ghanti phul	**Kingna phung**	Onagraceae	O	flower/Leaf	E	Diabetes
Girardinia diversifolia (Link) Friis	Allo	**Maayu sikwa**	Urticaceae	O	Bark	E	Stomachache
Glycine max (L.) Merr.	Bhatamas	**Chembi**	Fabaceae	T	Seed	P	Antidote
Gmelina arborea Roxb.	Khamari	**Hangesing**	Verbenaceae	O	Bark	E	Jaundice
Gossypium arboretum L.	Kapas	**Khinambo**	Malvaceae	T	Seed	P	Scabies
Graphis sp.	Jhyau	**Lungasekpa**	Graphidaceae	T	whole plant	P	Cut
Hemiphragma heterophyllum Wall.	Nasejhar	**Parubanegho**	Scrophulariaceae	I	Pollen grain	Sm	Sinusitis
Heracleum nepalense D. Don	Chimphing	**Chimphing**	Apiaceae	O	Fruit	E	Cholera/Food poison,
Hibiscus sabdariffa L.	Benchanda	**Sutsutte**	Malvaceae	O	Flower	S	Dysentery/Gastric,
Hodgsonia macrocarpa (Blume) Cogn	Ban pharsi	**Tambhungyakko**	Cucurbitaceae	T	Root	D	Cut
Holarrhena antidysenterica (Roxb. Ex Fleming) Wall. Ex A. DC.	Indrajal	**Karingo**	Apocynaceae	O	Bark	S	Rheumatic
Holarrhena pubescens (Buch-Ham)	Khirlo (Aule)	**Yengoba**	Euphorbiaceae	O	Bark	E	Gastric/ Piles
Homalium napaulense (DC.) Benth.	Phalame	**Phenjelangma**	Flacourtiaceae	T	Bark	P	Fracture
Imperata cylindrical (L.) P. Beauv.	Siru	**Ning**	Poaceae	T/ O	Root	E	Antidote/Worm
Ipomoea hederifolia L.	Lahare siudi	**Iwalungdinba**	Convolvulaceae	T	Fruit	P	Dandruff

Jasminum arborescens Roxb.	Chameli	**Chophung**	Oleaceae	O	Bud	E	Pneumonia
Jasminum humile L.	Jai	**Komena phung**	Oleaceae	O	Leaf	E	Pneumonia
Jatropha curcas L.	Kadam (Saruwa)	**Ranikhel**	Euphorbiaceae	O	Latex	R	Toothache
Juglans regia L.	Okhar	**Khesik(Khause)**	Juglandaceae	O	Fruit	R	Laxative
Juniperus recurva Buch-Ham. Ex D. Don	Bhairungpaati	**Sange**	Cupressaceae	I	Leaf/Stem	Sk	Headache/ Stomachache
Lantana camara L.	Kirne kaandaa	**Namsuphung**	Verbenaceae	T	Seed	P	Piles
Lepidium sativum L.	Chamsur	**Sipha**	Brassicaceae	T	Whole plant	P	Fracture
Leucas cephalotes (Roth.) Spreng.	Dronapuspa	**Tongphung**	Lamiaceae	O	Leaf	S	Menstruation problem
Lindera neesiana (Wall. Ex Nees) Kurz.	Siltimur	**Warekpa**	Lauraceae	T	Fruit	P	Scabies
Lobelia pyramidalis Wall.	Aklebir	-	Campanulaceae	O	Stem	E	Laxative
Lycopersicon esculentum Mill.	Golbheda	**Laphenda**	Solanaceae	T	Bud	E	Wound
Lygodium sp.	Lahare unyu	**Kattekwa**	Schizaeaceae	T	Leaf	E	Wound
Lyonia ovalifolia (Wall.) Drude	Angeri	**Tabea**	Ericaceae	T	Bud	P	Scabies
Maesa chisia Buch-Ham. Ex D. Don	Bilaune	**Yangjengwa**	Myrsinaceae	O	Bud	E	Epilepsy
Maesa macrophylla (Wall.) A. DC.	Bhogate	**Ammrakakma**	Myrsinaceae	O	Fruit	S	Diarrhea/Jaundice,
Mangifera indica L.	Aap	**Aabe**	Anacardiaceae	T/ O	Bark/Latex/ Root	P/E	Dislocated joint/Jaundice/Piles
Mangifera sylvatica Roxb. Ex Wall	Ban aap	**Lekse**	Anacardiaceae	O	Bark	E	Gastric
Melia azedarach L.	Bakaina	**Thumrangse**	Meliaceae	T/ O	Bark/Fruit/ Leaf	P	Scabies/Toothache
Mentha arvensis L.	Padina/Pudina	**Padena**	Lamiaceae	T/ O	whole plant	P/E	Cut/Common flu
Mesua ferrea L.	Naageswari	**Anjamse**	Clusiaceae	T/ O	Bark/Stem	P	Hydrocele/Wound
Mimosa pudica L.	Lajjawati	**Ikphura**	Fabaceae	T/ O	Bark/ Root	P/E	Menstruation problem/Wound
Oroxylum indicum (L.) Kurz	Totala	**Nepphe**	Bignoniaceae	O	Leaf	C	Toothache

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Osbeckia nepalensis Hook.	Angeri (khane)	**Mendamakla**	Melastomataceae	O	Bark/Flower/Fru	Eit	Diarrhea/Gastric Jaundice/Lithontripic
Oxalis latifolia Humb.	Chari amilo	**Sukroti**	Oxalidaceae	T/ O	Whole plant	P/E	Ophthalmic problem/Rabies
Oxyspora paniculata (D. Don) DC.	Gaitihare	**Saktundunna**	Melastomataceae	O	Root	E	Stomachache
Perilla frutescens (L.) Britton.	Silam	**Nambhang**	Lamiaceae	O	Seed	R	Measles
Vigna radiate (L.) R. Wilczek	Munga dal	**Sakcha**	Fabaceae	T	Seed	P	Fracture
Phyllanthus emblica L.	Amalaa	**Angwara**	Euphorbiaceae	O	Bark/ Fruit	E	Diarrhea/Laxative,
Phytolacca acinosa Roxb.	Jaringo	**Yaktewa**	Phytolaccaceae	O	Whole plant	E	Gastric
Pieris Formosa (Wall.) D. Don	Balu	**Kekphel**	Ericaceae	I	Root	D	Rheumatic
Pinus roxburghii Sarg.	Rani salla	**Aang**	Pinaceae	T	Latex/Leaf	R	Fracture/Hydrocele
Piper chaba Hunter	Chaabo	**Chabo**	Piperaceae	T	Root	P	Wound
Plumbago zeylanica L.	Chitu	**Chitu**	Plumbaginaceae	T/ O	Root	P/E	Appetiser/Dislocated joint
Polygala abyssinica R. Br. ex Fresen.	Gahate jhaar	**Pheksukse yan**	Polygalaceae	O	whole plant	E	Dysentery
Polygonum affine D. Don	Thotne	**Sampyu**	Polygonaceae	T/ O	Root	P/E	Abortion/Cut
Pouzolzia hirta (Blume) Hassk.	Saano chiple	**Tuiremba**	Urticaceae	T	Root	P	Fracture
Prunus cerasoides D. Don	Paiyun	**Umphung**	Rosaceae	T	Bark	P	Fracture
Prunus persica (L.) Batsch.	Aaru	**Khamrek**	Rosaceae	T	Tender Bud	P	Wound
Psidium guajava L.	Ambak	**Lupse**	Myrtaceae	O	Root's Bark	P	Laxative/Toothache
Punica granatum L.	Daarim	**Lalimse**	Punicaceae	T/ O	Fruit/ Root	E	Laxative/ Rabies
Pyracantha crenulata (D. Don) M. Roem.	Ghaanghaaru		Rosaceae	O	Root	P	Burnt
Pyrus pashia Buch-Ham, ex D. Don	Mehel	**Thambenchhe**	Rosaceae	T	Fruit	S	Dysentery
Quercus glauca Thunb.	Phalat	**Yahi**	Fagaceae	T	Bark	P	Fracture
Raphanus sativus L.	Mula	**Labhak**	Brassicaceae	T	Seed	P	Ring Worm

Rauvolfia serpentine (L.) Benth. Ex Kurz.	Sarpagandha	**Aaseksin**	Apocynaceae	O	Root	C	Diabetes
Rheum emodiaustrale D. Don	Padamchal	**Padamchal**	polygonaceae	T/ O	Root	P/E	Abortion/Cut
Rhododendron anthopogon D. Don	Sunpati	**Mudensukpa**	Ericaceae	I	Leaf	Sk	Tobacco addiction
Rhododendron arboretum Sm.	Guraans/Laligura ns	**Thokpet**	Ericaceae	O	Bark/flower	E	Jaundice/Choking fish bone
Rhododendron grande Wight.	Patlingo	**Thokpet**	Ericaceae	O	Bark	E	Jaundice
Rhus parviflora Roxb.	Satibayar	**Iksewa**	Anacardiaceae	O	Bark	E	Gastric
Ricinus communis L.	Aderi	**Khungnama**	Euphorbiaceae	T	Root	E	Fracture
Rosa brunonii Lindl.	Bhaise kanda	**Sangwatingrek**	Rosaceae	T	Root	P	Dislocated joint
Rosa indica L.	Gulab	**Lojiphung**	Rosaceae	T	Flower	E	Ear problem
Rubus ellipticus Sm.	Ainselu	**Tingrek**	Rosaceae	O	Root/Tender Bud	E	Diarrhea/Dysentery
Rubus nepalensis (Hook. f.) Kuntze	Bhuin ainselu	**Kakwa tingrek**	Rosaceae	T/ O	Leaf/Root	P	Stomachache/Wound
Rumex nepalensis Spreng.	Halhale	**Tangsanglabo**	Ranunculaceae	T	Root	P	Ring Worm
Saccharum officinarum L.	Ukhu	**Sot**	Poaceae	O	Stem	J	Jaundice
Salvia hians Royle ex Benth.	Mirlejhar	-	Lamiaceae	T	Whole plant	P	Scabies
Sapindus mukorossi Gaerth.	Ritthaa	**Phimbrikwa**	Sapindaceae	T	Fruit's Bark	P	Dandruff
Schima wallichii (DC.) Korth.	Chilaaune	**Yangsingba**	Theaceae	T/ O	Bark/ Fruit	P	Antidote/Jaundice
Scoparia dulcis L.	Kharete jhar	-	Scrophulariaceae	O	Whole plant	E	Jaundice/Menstruation problem
Scurrula elata (Edgew.) Danser.	Aijheru	**Singdhaba**	Loranthaceae	T	Bark	P	Fracture
Selinum wallichianum (DC.) Raizada & Saxena	Bhutkesh	**Lechhm sing**	Apiaceae	I	Flower/Leaf	Sm	Headache
Sesamum indicum L.	Til	**Thang**	Lamiaceae	T	Seed	P	Measles
Shorea robusta Gaerth	Saal	**Sasing**	Dipterocarpaceae	T	Bark	P	Fracture/Wound
Sida cordata (Burn. f.) Borss. Waalk.	Lwangaphul	**Yerepmit**	Malvaceae	T	Leaf	P	Cut
Solanum torvum Sw.	Bihi	**Chikhuma**	Solanaceae	O	Fruit/Stem	E	Diabetes/Piles
Spilanthes acmella (L.) Murr.	Pire jhaar	**Chasuk**	Asteraceae	O	Leaf/Stem	C	Toothache

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Swertia chirayita (Roxb. Ex Fleming)	Chiraito	**Sunghinba**	Gentianaceae	O	Whole plant	E	Fever
Swertia multicaulis D. Don	Sarmaguru	-	Gentianaceae	T/ O	Root	P	Cut/Ulcer
Syzygium cumini (L.) Skeels	Jamuna	**Chambho**	Myrtaceae	T/ O	Bark/Fruit/ Root	P/E	Diarrhea/Diabetes/ Fracture
Tagetes patula L.	Sayapatriphul	**Thopaphung**	Asteraceae	O	Flower	E	Pneumonia/Throat sore
Taxus wallichiana Zucc.	Lotha salla		Taxaceae	T	Bark	E	Epilepsy
Tectaria macrodonta (Fee) C. Chr.	Kaalo unyu	**Kumakla katekwa**	Dryopteridaceae	O	Rhizome	C	Toothache
Terminalia bellirica (Gaertn) Roxb.	Barro	**Barra**	Combretaceae	O	Fruit	J	Throat sore
Terminalia chebula Retz.	Harro	**Hangam**	Combretaceae	O	Fruit	J	Piles/Throat sore
Thelypteris appendiculoides Fraser-Jenk.	Thaade unyu	**Katekwa**	Thelypteridaceae	T	Bud	E	Cut/Scabies
Thysanolaena maxima (Roxb.) Kuntze.	Amliso	**Sealo**	Poaceae	O	Root	E	Pneumonia/Worm
Tinospora cordifolia (Willd.) Hook. f. & Thoms.	Gujargaano	**Kengban**	Menispermaceae	O	Rhizome	E/P	Menstruation problem/Piles
Tinospora sp.	Raato Gujurgaano	**Heraba Kengban**	Menispermaceae	T	Rhizome	P	Fracture
Trichosanthes cucumerina L.	Ban Ghiraula	**Tambhung Toryan**	Cucurbitaceae	O	Fruit	E	Jaundice/Sinusitis
Trichosanthes tricuspidata Lour.	Indreni	**Saya**	Cucurbitaceae	O	Root	E	Diuretic
Ulmus lanceifolia Roxb. Ex Wall.	Chamlayo	**Tumsing**	Ulmaceae	T	Bark	P	Fracture
Urena lobata L.	Bhedekuro	**Akkephung**	Malvaceae	T/ O	Root/Seed	E	Toothache/Wound
Urtica dioica L.	Sisnu	**Sikwa**	Urticaceae	T/ O	Leaf/Root	P/S	Blood pressure/ Rabies
Valeriana jatamansii Jones	Sugandhawal	**Panwakphung**	Valerianaceae	O	Leaf/Root	E	Diarrhea/Epilepsy
Viburnum cotinifolium D. Don	Baklo pate	**Manggena**	Sambucaceae	T	Leaf	P	Cut
Viburnum cylindricum Buch-ham. ex D. Don	Ghodakhori	**Hangangse**	Sambucaceae	T	Fruit	O	Body massage
Viburnum mullaha Buch-ham. ex D. Don	Kabase	**Hangphewa:sing**	Sambucaceae	T	Root	P	Fracture

Viola sp.	Dudhe lahara	**Pitnu Iwat**	Violaceae	O	Fruit	E	Pneumonia
Viscum album L.	Hadchud	**Khewalangba**	Loranthaceae	T	Whole plant	P	Fracture
Vitex negundo L.	Simali	**Tekesing**	Verbenaceae	I/T	Bark/Bud/Leaf	Sk/E	Dislocated joint/Piles/ Sinusitis
Woodfordia fruticosa (L.) Kurz.	Dhaenro	**Pangwari**	Lythraceae	T/ O	Bark/Flower	E/P	Burnt/Dysentery
Xeromphis spinosa (Thunb.) Keay.	Maidal kanda	**Lungdingba**	Rubiaceae	T	Latex	R	Wound
Zanthoxylum armatum DC.	Timur	**Meadhing**	Rutaceae	O	Fruit	S	Cholera/Gastric
Zingiber cassumunar Roxb.	Phachyang	**Kherabe**	Zingiberaceae	O	Rhizome	S	Stomachache
Zingiber officinale Rosc.	Aduwaa	**Haabek**	Zingiberaceae	O	Rhizome	S	Cold flu
Zizyphus mauritiana Lam.	Bayar	**Tingsingba**	Rhamnaceae	T	Fruit	R	Measles

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On Praxiological Information

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Abstract - In this paper is outlined an action-oriented philosophy of information, namely praxiological information. The praxiological kind of knowledge and some of its species (behavior, communication, computation, information, attention, learning,) are introduced by the method of generalization and classification. By exploiting the metaphor of the spectrum of colors, the architectures of behavior, communication and computation are shown as if they were primary colors: red, yellow and blue. The architecture of information (green) is introduced by joining together the architecture of computation (blue) and communication (yellow). The principle of information, that is the Data Operational Principle, is stated; the informational bearers, that is messages, are explained; the informational criteria, that is connectivity and compatibility, are outlined; The architecture of attention (orange) is introduced by joining together the architecture of behavior (red) and that of communication (yellow). The criterion of attention, that is relevance, is pointed out.

Keywords : *generalization, praxiological-information, system, connectivity, compatibility, relevant information, effective information, synthesis.*

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On Praxiological Information

Antonio Florio

"If I have seen further it is by standing on ye shoulders of Giants"
Letter from Isaac Newton to Robert Hooke, 5 February 1676

Abstract - In this paper is outlined an action-oriented philosophy of information, namely praxiological information. The praxiological kind of knowledge and some of its species (behavior, communication, computation, information, attention, learning,) are introduced by the method of generalization and classification.

By exploiting the metaphor of the spectrum of colors, the architectures of behavior, communication and computation are shown as if they were primary colors: red, yellow and blue. The architecture of information (green) is introduced by joining together the architecture of computation (blue) and communication (yellow). The principle of information, that is the Data Operational Principle, is stated; the informational bearers, that is messages, are explained; the informational criteria, that is connectivity and compatibility, are outlined;
The architecture of attention (orange) is introduced by joining together the architecture of behavior (red) and that of communication (yellow). The criterion of attention, that is relevance, is pointed out.

The architecture of learning (violet) is introduced by joining together the architecture of behavior (red) and that of computation (blue). The criterion of learning, that is effectiveness, is pointed out.

The architecture of knowledge results to be an architecture composed by the integration of all the preceding architectures. Exploiting our metaphor, it can be regarded as the prism of Newton through which, when the colors (phenomena) are projected, the white light (knowledge) is obtained and vice versa. A new epistemology in which the keywords are pluralism, integration of phenomena and synthesis, is propounded. By the new epistemology knowledge results to be information which is relevant and effective. By the new epistemology the problem of the location of information is solved.

Keywords : generalization, praxiological-information, system, connectivity, compatibility, relevant information, effective information, synthesis.

On Praxiological Information:

1. The Praxiological Kind & Species of Information
2. The Praxiological Architecture of Communication
3. The Praxiological Architecture of Computation
4. The Architecture of Information, Messages & The Data Operational Principle
5. Where Is Information?
6. Relevant Information & The Praxiological Architecture of Attention
7. Effective Information & The Praxiological Architecture of Learning
8. The Pluralism of Phenomena & The Integrative Epistemology of Information.

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I. The Praxiological Kind & Species of Information

The seeds of the philosophical meditation on the notion of information-action oriented were planted very early by Rosenblueth, Wiener and Bigelow in "Behavior, Purpose and Teleology" (1943).

In this article I will present the trees of knowledge which are grown from those seeds. They are trees of different species and I name the kind of which the several trees are species the praxiological kind. The fruits of those trees are informational phenomena and, being them of the species of which the particular tree is, they represent the several species of the praxiological kind of information. Praxiological information, as I conceive it, has to be understood as a term which consists of the union of the term "praxis" that in philosophy designs the practical activity as different from the theoretical activity, and the term logical, that in this case refers to the theory which takes into account the implementation of informational phenomena, dynamics and technologies.

At the philosophical lecture the paper of Rosenblueth, Wiener and Bigelow is relevant because it introduces a method of generalization and classification of the external structural properties or invariants of the objects by which the study of the objects is carried out irrespective of the analysis of their internal functional structures (which usually are regarded as black-boxes). The method of generalization is a method quite intuitive and particularly used in mathematics (Mac Lane, 1986) and in science in general, being it the usual method of laboratory of the scientist which consists in isolating the object in an experimental stance and which consists in the classification of the object in terms of its external observable properties, that is in terms of its input-output relations. This input-output relation is the cause of the change and therefore it is regarded as the behavior of the object which, observed in its input-output relations, becomes a system or, philosophically speaking, a phenomenon. Here the philosophical sharping difference between what is hidden, that is the internal and not observable structure of the object, and what is not hidden, that is the external, observable and classifiable behavior of the object, applies.

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Now, if the black box is the metaphor from the point of view of the internal functional analysis of the structure of the system, I will propose, from the point of view of the analysis of the external structural properties or invariants of the system, the metaphor of spectrum of colors. In according to the theory of colors, the spectrum of colors is composed of the primary colors: red, yellow and blue; by the secondary colors: green, orange and violet, which are obtained by the union of the primary; and by all the other infinite gradations of colors which are obtained by joining together the primary and secondary colors.

I will name architecture or colored box the external structural properties or invariants of the system to distinguish them from the internal functional structure of the system that, in according to the common use and scientific practice, is called black box.

In the distinction between black box or internal structure and colored box or architecture the point is to stress what are the primary constituents of the ontology of the theory. In the case the study is carried out on the internal structure the primary constituents of the ontology are objects and set of objects, whereas in the case in which the study is carried out on the external properties or invariants of the structure (that is on its architecture) the primary constituents of the ontology are structures and set of structures. The same thing can be said by naming the internal structure as semantic structure and the external structure as ontological structure and remarking that both kinds of structure are functional.

Naturally, as an Italian, I prefer to put the difference in term of aesthetics, but I have to alert that, because of the subtle threat among beauty, good and right and of course among its contraries, the metaphor of black box and colored box is much more than an aesthetic metaphor. Evidently, given that my framework is that philosophical between power and action, here we are facing that dilemma of the white side of the force and the dark side of it.

According to the above metaphor the architecture of the system is represented by the red box (fig. 1).

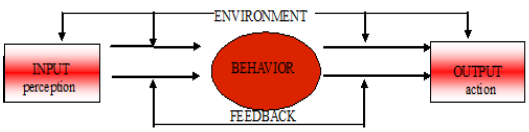


Fig. 1 : The architecture of behavior (adapted from General System Theory, von Bertalanffy 1950)

Now before to proceed it is to note that, by the method of generalization and classification, the teleological cause is introduced in the classification of the behavior and therefore in the scientific explanation of the system. It is to remark that the teleological cause distinguishes completely this behavioral approach from the psychological behaviorism in which framework the cause is regarded always as an efficient cause.

According to the relation input-output, the behavior is classified in active/non active (or passive) behavior. The active behavior is classified in purposeful/purposeless (or random) and for purposeful behavior is meant that the action is directed to a goal. In turn the purposeful behavior is classified in teleological or feed-beck and non-teleological or non- feed-beck behavior where for feed-beck or teleological is meant that the output reenter in the incoming input. The servomechanich concept of feedback is the generalization of the physiological, biological and ecological concept of homeostasis (Cannon, 1932). The concept of teleology was challenged in biology by that of teleonomy (Pittendrigh, 1958) to point out that the goal-directedness is not committed to the Aristotelian teleology as a final causal principle and subsequently the term teleonomy has replaced the term teleology in Cybernetics (Monod and Francois, 1961) and it has entered in the scientific practice, from the natural to the social sciences, being it closely related to the concepts of emergence and self-organizing systems.

Moreover the feedback behavior is classified in positive and negative feedback. For negative feed-beck is meant *"control by the margin of error at which the object stands at a given time with reference to a relatively specific goal"* (Rosenblueth, Wiener, Bigelow, 1943, p. 2). Finally the feed-back purposeful behavior can be classified in extrapolative or predictive and in non-extrapolative or non-predictive; and the predictive behavior can be focused at several degrees of complexity (fig. 2).

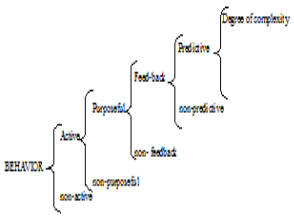


Fig. 2 : Classification of behavior (from Rosenblueth, Wiener, Bigelow, 1943)

Standing to the above classification behavior is an input-output architecture of which its specific criterion is its being active at different levels of complexity. *"Active behavior is that in which the object is the source of the output energy involved in a given specific reaction. The object may store energy supplied by a remote or relatively immediate input, but the input does not energize the output directly. In passive behavior, on the contrary, the object is not a source of energy; all the energy in the output can be traced to the immediate*

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input (e.g., the throwing of an object), or else the object may control energy which remains external to it throughout the reaction (e.g., the soaring flight of a bird)" (Rosenblueth, Wiener and Bigelow 1943, p.1). Moreover at some level the active behavior manifests as teleonomical where for teleonomical is meant negative feedback which consists in a sort of circular causality by which the output is returned in the incoming input of the system and it corrects its outcome. It is exactly this process of negative feedback that is responsible of the organization, that is information, of the system.

In what follow I will show that the architecture of behavior outlined above is isomorphic to many informational phenomena. In fact the method of generalization and classification of the external properties of the object (that is of its behavior) is at the core of the discovery that the input-output relation is a general servomechanic architecture that is structurally identical to many informational phenomena. I will outline the structural identity among behavior, communication, computation, information, attention and learning. At first, in the next paragraph, I will outline the structural identity between the behavioral system and the communicational system. My move is perfectly coherent with the idea of N. Weiner (1961) who founded Cybernetic as the science of control and communication and envisioned that the apparatus input/output of the agents (of which subclasses are the perception-action apparatus of animals and plants and the afferent-efferent physiology of neurons) is isomorphic to the process of communication. And at least this is my way of seeing the things. In the following paragraphs I will outline all the other structural identities constructing them with the metaphor of the spectrum of colors.

II. The Praxiological Architecture of Communication

The basic idea of Shannon"s "The Mathematical Theory of Communication" (MTC), usually just called „information" theory, is to measure the quantity of information or entropy H of massage with the logarithm N of the number of equiprobable messages:

$$log(N)= bit\ for\ Msg$$

If the occurring messages are equiprobable, the quantity of information of each message is given from the probability of occurring of that message multiplied for the logarithm of such a probability:

$$H= p1\ log/p1$$

The function that defines the quantity of information generated from the source is defined as the natural logarithm of the sum of messages:

$$H= (log\ (N)+log(N)2 +\dots)\ bit\ for\ msg$$

If the occurring messages are not equiprobable (as it is in natural language) the function that defines the quantity of information generated from the source is the sum of probability (*p1,p2,p3,...)* of the occurring messages multiplied for the logarithm of such probability:

$$H= (p1\ log/p1+p2\ log/\ p2 +\dots)\ bit\ per\ Msg;$$

The Shannon's approach to information is a quantitative approach and specifically the information contained in a message depends on the probabilistic distribution of the source, which is called entropy, in a way that the amount of information of a message depends on the inherent uncertainty of the source. Practically the quantity of information is a measure of uncertainty, that uncertainty that has been removed after observing the outcome of the source.

As Shannon (1948) pointed out *"Frequently messages have meaning; that is they refer to or are correlated according to some system with certain physical or conceptual entities. These semantics aspects of communication are irrelevant to the engineering problem. The significant aspect is that the actual message is one selected from a set of possible messages. The system must be designed to operate for each possible selection, not just the one which will actually be chosen since is unknown at the time of design"*.

Later in its life, Shannon (who was not a philosopher), in according with the preceding view, identified three levels of problems in the study of information. The first is the technical level and it is the level which MTC is about. The second and the third are respectively the level of the problem of the content of information and the level of "effectiveness" or of the way in which the content of information affects the conduct of the receiver of that content. The second and third problem have attracted the attention of philosophical investigations being closely related to semantic and pragmatic studies.

Nevertheless the dogmatism with which the contemporary philosophers of information have assumed MTC and the task of solving the semantic and pragmatic problems of Shannon as the necessary foundation of their philosophies of information seems to me unsatisfactory nor it seems to me the only viable possibility for philosophy.

In fact there is a third view to consider MTC and his huge, even if partial, contribution in the account of the phenomenon and concept of information. This view is the praxiological view and it attempts to answer to the question of what information is nor in a quantitative way by offering a measure of its quantity (the Shannon's measure in this respect is completely satisfactory even if it is not the only viable measure of information, in fact another quantitatie measure of information, which is pretty different even if complementary to that of

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Shannon, is given by Kolmogorov complexity) nor in a semantic or pragmatic way by analyzing the meaning of information. The praxiological view holds for a qualitative analysis of the communicational systems and answers to the question of what information is by analyzing how information acts. There is a slogan for this view: information is what information does.

By the praxiological genus of information the Shannon and Weaver's model of communication is considered as one of the species which manifests an informational nature and it is investigated in the usual laboratory approach which consists in to live aside its internal structure[1] and which instead focuses the attention on the architecture of the communicational objects.

The communicational object is a system that conveys information from the source to the receiver and it is constituted from a couple of objects, input and output, everyone assuming a finite number of states, and by a channel by which communication flows. Any state of the input is coded by a symbol of the finite alphabet X and any state of the output is coded by a symbol of the finite alphabet Y, and if the input is in a certain state x belongs to X, than the output assumes any state of Y with a certain probability depending exclusively from x.

So that the external structure of the communicational model configures as architecture input-output and it is structural identical to the architecture of behavior. Accordingly we assign the yellow color to the architecture of the communicational model, which considered in its input-output relation, becomes a system (fig.3) or, philosophically speaking, a phenomenon.

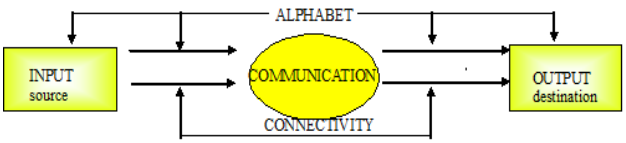


Fig. 3 : The of Communication (adapted from the Mathematical Theory of Communication of Shannon and Weaver, 1949)

Now, just this architecture holds for a praxiological approach to the study of communication. Our praxiological approach consists in observing the relation input-output of the system, that is in observing the behavior of the system, and consists in a classification of the communicational behavior.

Taking into account the architecture of the system the communication is classified in connected/non-connected.

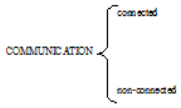


Fig. 4 : Classification of the architecture of communication

In the above classification the criterion of the communicational architecture is connectivity. In fact it is pacific that if in the process of communication the source and the destination are not connected then there is not communication at all or, at least, there is only useless communication.

It is to note that the classification of the communicational architecture does not have other criteria besides connectivity, differently from the classification of the architecture of behavior (see figure 2), because the Mathematical Theory of Communication is a syntactic theory and in such a sense it is behavioristically poor.

III. The Praxiological Architecture of Computation

By the praxiological genus of information computation represents one of the species which manifests an informational nature and it is considered in the usual laboratory approach which consists in to live aside its internal structure and instead consists in focusing on its architecture.

Today computation represents a broad field of investigation. But for this attempt it will suffice to take just a look of the Theory of Automata.

Automata Theory studies the relation among three objects: grammar, language and machine. The grammar can be thought as representing the generativity, the language the definability and the machine the acceptance or recognition.

Now without entering in the details and without loss of generality the important thing to note here is that there are different classes of grammars that generate different classes of languages that can be recognized by different but appropriate machines. For example a regular grammar generates a regular language which expressions or words are accepted by a deterministic state automaton (DFA). In such a sense the grammar and the automaton must be compatible otherwise the automaton for that expression generated by the grammar cannot be constructed.

[1]The internal functional structure of information is the basic concept under analysis in Floridi"s and Dretske"s philosophies of information which hold for semantic notions of information. Both philosophies of information are representationalist and post linguistic philosophies of information and moreover both philosophies have their foundation on the Mathematical Theory of Communication disregarding completely the computational side of information and all its other myriad of aspects.

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The place and the between in which this compatibility holds or does not hold is the formal language.

These architecture that I have just now described is the most general generalization (if the expression can be bypassed!) of computation and it can be focused at a lower level of the simple physical automaton. In fact the architecture of the automaton can be thought as subclass of the architecture of computation.

Without loss of generality we can take as our model the Deterministic Finite Automaton (DFA) which is the most simple automaton. DFA has two levels of description, the hardware and the software level.

At the hardware level the automaton is a machine consisting of five components: a single internal register (finite control), a set of values for the register (the states), a tape, a tape reader and an instruction set. At the software level DFA is a quintuple $M = (Q, \Sigma, \delta, q_\circ, F)$, where Q is finite set of states, Σ a finite set called the alphabet, $q_\circ \in Q$ a distinguished state known as the start state, F a subset of Q called the final or accepting states, and δ a total function from $Q \times \Sigma$ known as the transition function.

Now it is to note that in each physical realization of the automaton the hardware must be compatible with the software and vice versa, otherwise the computation is impossible. Everybody today knows this simple law of technology. The place and the between in which hardware and software match and show their compatibility is known as the interface.

Now being the architecture of computation like that I have described one can think to computation as a couple of systems: input and output representing respectively grammar and automaton at the most general level of Automata Theory and hardware and software at the more specific level of the automaton.

So that, accordingly to the metaphor, I assign the blue color to the architecture of computation, which considered in its input-output relation, becomes a system (fig. 5) or, philosophically speaking, a phenomenon.

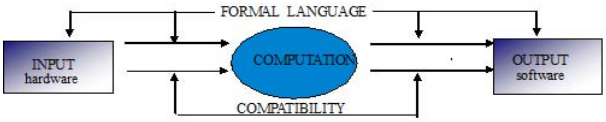


Fig. 5 : The architecture of Computation (adapted from Automata Theory

Now, just the above computational architecture holds for a praxiological approach of the study of computation. Our praxiological approach consists in observing the relation input-output of the system, that is in observing the behavior of the system, and consists in the classification of the computational behavior.

Taking in consideration the architecture of the system the computation is classified in compatible/non-compatible (fig. 6).



Fig. 6 : Classification of the architecture of computation

In the above classification compatibility is the peculiarity of the computational architecture in respect to the behaviorist and to the communicational architectures. In fact it is pacific that if in a computational engine the hardware and the software are not compatible then the machine does not work. Otherwise standing to the general architecture of the classes of regular grammar, regular expressions and Deterministic State Automata that I have outlined above it is demonstrable that if some non regular expression is introduced then can be shown that the DFA that accepts that expression cannot be constructed. The same is true for the all the other classes of more sophisticated automata which show their compatibility one to one with the Chomsky hierarchy of gramars.

It is to note that the classification of the computational architecture does not have other criteria besides compatibility, contrary to the architecture of behavior (see figure 2), because the Theory of Automata is a syntactic theory and in such a sense it is behavioristically poor.

IV. The Architecture of Information, Messages & Data Operational Principle

At this point I have analyzed, and of course the method of generalization is fully loaded already of synthesis, three different but isomorphic informational architectures and, accordingly to the metaphor, I have assigned a primary color to each one of those. Now my task is to make a synthesis, in the philosophical sense of synthesis as the moment following the analysis. Accordingly to the metaphor the synthesis will consist in the union of the primary colors to obtain the secondary colors and to complete the spectrum of colors.

At first we join together the architecture (yellow) of communication with that (blue) of computation. By joining the architecture of communication and that of computation we obtain the architecture of information which results to be of green color (fig. 7)

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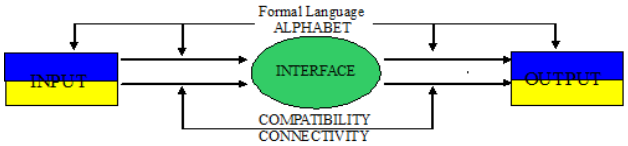


Fig. 7 : The Architecture of Information

It is pacific that information inherits the criteria of communication and computation, that is connectivity and compatibility.

But now there is to outline the informational bearer. Messages are our candidates and this is in agreement with the scientific practice even if it is in disagreement with the contemporary philosophies of information which instead assume propositions, factual or intentional, as informational bearers.

Certainly messages have more than fifty years of well established scientific status. In fact they have a quantitative measure by the Mathematical Theory of Communication. But we do not want only a quantitative measure of the message. In fact we are searching for the architecture that all the messages share. This architecture is our guarantee of the functionality of messages to play the rule of atomic constituents of information.

The architecture of message is composed of three alphabets (fig. 8):

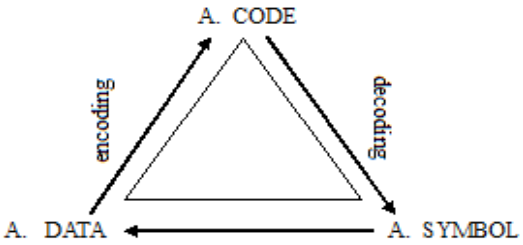


Fig. 8 : The architecture of message

1) INFINITE ALPHABET DATA: A datum is a difference; the shortest and simplest datum is the bit, binary unit of information, made of [1,0]. You can look easy if I write 0 and 1 as $x \neq y$ that it is a difference. It is a relation of difference (see Floridi"s Diaphoric Definition of Data (DDD), 2003a, 2005). The infinite set of data is called the Alphabet Data (AD).
2) FINITE ALPHABET CODE: The Bit {1,0} as Code is the finite and simplest binary and digital Alphabet Code (AC), made of data, of information. The Code is derived from data: from the bit units [1,0] to the Bit Code {1,0}.
3) INFINITE ALPHABET SYMBOLS: With this finite and digital Alphabet Code (AC) that we call Bit Code {1,0} we can produce all the infinite symbols and strings of symbols of the Alphabet Symbols (AS). Practically data are "something that stay for something else" and symbols are "that something else for which data stay".

By the Alphabet Code data are encoded in symbols and symbols are decoded in data. The Bit Code (AC) is a bijective function from AD to AS that is injective and surjective:

a) injective: $\forall x \forall n(f(x) = f(n)) \rightarrow x=n;$

b) surjective: $\forall m \in \text{AS}\ \exists n \in \text{AD}\ F(n)=m$

Practically AC becomes a free monoid {AC}* (Alphabet Code Star) that is the set of all strings that we can make with AC. Where $x \in$ AS means that a string of {AC}* belongs to AS. Practically AC is a function from the set of data to the set of strings of symbols: $AC^* \leftrightarrow AS$. In informatics jargon it calls Interface.

Now by the architecture of the message we directly derive the principle of information that I name the Data Operational Principle (DOP) which completely distinguishes this approach from the semantic, pragmatic and logical pluralist approaches to information which instead take as principle the Data Representation Principle (DRP) (Floridi 2005, Allo 2007).

The DOP, in its negative formulation, tells us that there is not information without data operation and, in its positive formulation, asserts that information is made by the data encoding and decoding operations (fig. 8).

But that's not all. In fact now there is to outline the infinite process of information. It is implicit in the Data Operational Principle because in the Alphabet Code there is the codification of the alphabet data in the alphabet symbols and vice versa. The infinite process of information is that process by which a code can became data for another code and so on and so forth ad infinitum. This is the infinite process of information (fig. 9).

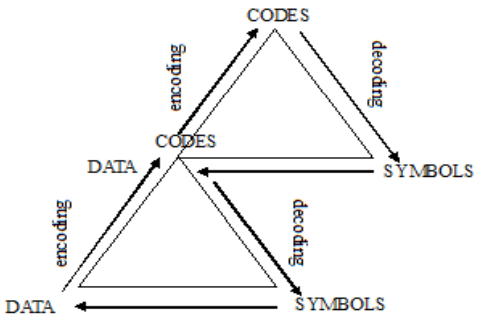


Fig. 9 : The infinite process of information

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This figure drawn above has to be regarded as a section of the spherical spiral but to offer an exhaustive image of the infinite process of information is an enterprise that belongs to that field of human knowledge called Logic of Scientific Discovery and therefore it is not my goal in this paper. For the moment it is to remark that I have outlined the architecture of information, the informational bearers, the principle of information and the infinite process of it. But now there is to face with one of the deepest questions of our epoch: where is information?

V. Where is Information?

The story of "Where information is" is the biggest question of the science of our time and certainly one has to be scientifically and philosophically minded (where only one of the two is not enough) to appreciate the whole of this claim.

The story of where is information is a bit the story of relevant information. As Saracevic (1975) reveals, relevant information is an elusive human notion and Information Science comes to the light for treating, with logic and philosophy, the concept of relevance.

The story of Information Science is a bit the story of the virtual library of the future. It is an on-line library and the total knowledge is in the books of that library. It is a bit as the library of the magic, all the magic that exist is in the books of that library. As far as the production of knowledge increases and the library becomes more and more comprehensive, in the virtual library, as well in the library of the magic, the question of the location of information, that is "where is information?", become more and more relevant.

As it is emerged by information science literature, there are two way of theorizing the phenomenon of relevant information: agentive (subjective) oriented relevant information and system based (objective) relevant information.

The contemporary Semantic Philosophies of Information share this same bipartite and out-out analysis with Information Science. In fact objective and subjective are semantic and representationalist features. The semantic theories of information, in according with Nauta (1972), are representationlist and post linguistic theory of information. In fact they assume as principle of information the data representation principle (DRP) which states: "no information without data representation" (Floridi 2005 and Allo 2007). Representation, from the antiquity up to now, involves a theory of truth. Truth, in fact, from the antiquity up to now, means correctness of the enunciation and an enunciation is correct if it is directed towards the entity and what it claims *represents* the entity. It enunciates about the entity "what it is like". The enunciation is the place of truth, but not only, it is the place of falsity, of the lie. Now, for the semantic (and pragmatic) theories, taking information as the content of the enunciation (the content of the factual sentences as "the lawn is green" or of the intentional sentences as "she believes that the lawn is green") would mean that information does not distinguish from content. At this point the semantic theories of information elect as criterion of information the truthfulness of it and this is enough to distinguish the content of the enunciation, which can be true or false, from the content of information which is only true. I think that the truthfulness of information, if not a dogma, is nothing at all. But in anyway, let it be what it is, analyzing information in terms of true content, factual or intentional, that is to say that in the most part of cases we are merely informed and we do not know really. So that the semantic conceptions of information need a theory of justification which asserts that not only the content of information is true but, to count as knowledge, it must be justified. Therefore they assume as theory of justification the relevance of information.

Now, there are two way of interpreting the Data Representation Principle which depend on two way of interpreting the representation.

The doctrine by which *representation* directs toward the entity, for showing it in the enunciation in the manner in which it is, holds for the opinion that representation joins the things (res) in themselves and what the things belong (reality) and it is called realism.

The doctrine of representation which doubts that the *representation* joins the entities in themselves instead of staying in the environment of its proper activity (soul, spirit, conscience, ego) holds for the opinion that the representation refers only to itself as *representation of a representation* and it is called idealism. Standing to this antique philosophical dispute, the semantic theories of information divide in two doctrines.

The doctrine that considers the data representation as representation of the physical and material reality, that is to say "no information without physical implementation", holds for a realist view of information. This is the view of Dretske and of the correlation paradigm in general. The doctrine that considers the data representation central for information, given that, by the principle, there not could be information without representation, but nevertheless rejects the thesis that information requires necessarily a physical implementation because there could be information as representation of a representation, holds for a idealist view of information. This is the view of Floridi[2].

Now, being information a subjective magnitude for the idealist, subjective is too the theory of justification that the idealist can offer for his epistemology. In fact Floridi (2006) offers a subjective theory of relevant information which implicitly is too his answer to the question of where information is: it's in the subject.

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Conversely, being information an objective magnitude for the realist, objective is too the theory of justification that the realist can offer for his epistemology. In fact Dretske (1981) holds for an objective theory of relevant information and it's too his answer to the question of where information is: it's in the object or in the environment.

But I have other views and other fly to propose. At first I assume the Data Operational Principle (DOP), as outlined in the paragraph number three, as principle of information. Second I take the messages as information bearers, being this in completely agreement with the scientific practice, and therefore it is in the messages that the phenomenon of relevant information has to be searched. Third I propose two informational criteria for knowledge: one being relevance and, of course a message could be perfectly relevant and completely false or perfectly true and completely irrelevant; the other being effectiveness.

Outlining the criteria of relevance and effectiveness will be my task in what follows.

VI. Relevant Information & the Praxiological Architecture of Attention

What Information Science reveals is very instructive, in fact being relevance a bit the question of "where information is" it is therefore a bit the quest itself of the research, even if it is not its total story nor its ultimate answer. In fact relevance is the story of the research from the communicational side of it.

I'm holding for the thesis that if connectivity is the servomechanic criterion of communication, as it is and as I have explained in paragraph 1, relevance is the human criterion of it (communication). Sure the research is an exquisite human enterprise and relevance in scientific communication, if rightly questioned has to tell us how happens that, at certain time, limited and finite human beings as Archimedes for example, and Leonardo, Kepler, Galileo, Fermat, Galois, Mendel, Darwin, Laplace, Pasteur, Faraday, Thomson, Gibbs, Eddington, Dirac, Turing, Wiener and so forth, are able to open such a fruitful research lines. It is a bit the story of the relation of the finitude of human beings which yearn to be in contact with something opposed to their finitude and which has been experienced, from a good part of the good phenomenological continental philosophy, in the pessimistic perspective of a lack. Less pessimistic it is the outcome of the scientific thought. In fact the relation of human beings with knowledge is achieved in the time and experienced in the space, as cosmos, or order, or totality, or place.

It is not my attempt to give here an outline of the informational logic of scientific discovery and I postpone this outline to another article that for the moment is work in progress. What I will outline here is the criterion of relevance for humans and high level animals in respect to their practical and cognitive abilities.

In fact I'm holding for the thesis that relevance is the criterion of attention for humans and animals and that it is a criterion that emerges from joining the criteria of the communicational and the behavioral architecture. Not only that, in fact I'm holding for the thesis that attention itself is a phenomenon that emerges by joining the behavioral and the communicational architecture. As an example, for my behavioral perspective, the sense organs are communicational engines. They behave like channels that connect the environment (that is the source) to whom experiences that environment (that is the receiver). Now attention is a kind of sixth sense for humans and high level animals. Plants and low level animals as well as machines can be considered as communicational engines and as connected with their environment but they do not show nothing comparable to human attention and relevance. Consciousness, in this perspective has to be regarded as a communicational human emergent property from the complexity of the phenomenon of attention. But at the actual state of affair this can be taken only as an intuition which I will develop in other papers.

Attention, which operates to convey the relevant information from environment to whom experiences that environment for his practical tasks, is constituted by a couple of systems: input-output, and by a channel which in the behaviorist approach can be regarded as the sense organs by which information flows.

I will show what attention is by jointing the communicational system (yellow) with the behavioral system (red). By joining them we obtain the architecture (orange) of attention (fig.10).

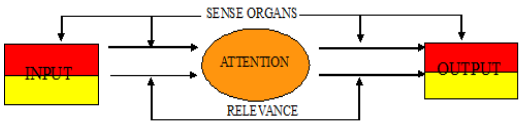


Fig. 10 : The Architecture of Attention

[2]Certainly I will not wear out the time of the reader proposing a technical definition of data, given that the interested reader can find a lot of definitions in Wikipedia and perhaps the better one is that of Floridi (2003a, 2005), the Diaphoric Definition of Data (DDD). What I will say is only that, being data those vehicles of representation, then, evidently, about data we have more than two thousand years of philosophical investigation.

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Just this architecture holds for a praxiological approach to the study of attention. Our praxiological approach consists in observing the relation input-output of the system, that is in observing the behavior of the system, and consists in a classification of the attentive behavior.

Taking into account the architecture of the system, attention is classified in relevant/non-relevant. Relevant behavior is the connected and active behavior in which the object is the source of the output energy involved in a given specific reaction. That is to say that just what kind of relevant information may be picked up by depends upon just what kind of device the agent is and upon just what kind of organs the agent is equipped with. Plants and at some extent machines can be assumed as perceiving agents and their criteria is the connectivity. Attention with his criteria of relevance is a peculiarity of some high level complexity animals and human beings.

The relevant behavior, that is attention, is classified in purposeless/purposeful. For purposeful attention is meant that the attention is directed to a goal. In turn the purposeful attention is classified in feedback/non-feedback attention; and the feedback attention is classified in positive and negative feedback. Again the feedback purposeful attention can be classified predictive/non-predictive and the predictive attention can be focused at several degrees of complexity (fig. 11).

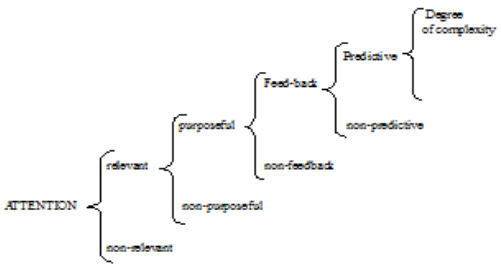


Fig. 11 : Classification of the architecture of attention

In the above classification the first criteria is the peculiarity of the architecture of attention in respect to the behaviorist, the communicational and the computational architecture. It is obtained joining together the criterion of the architecture of behavior, that is activity, with that of communication, that is connectivity. Otherwise is quite intuitive that from an active and connected behavior emerges the attention.

This is too a partial and non ultimate answer to the question of where information is: it is in the attention.

VII. Effective Information & the Praxiological Architecture of Learning

I have remarked that the story of relevant information is only a bit the story of where information is. To complete that story we have to take in consideration the phenomenon of effective information. This phenomenon, if not completely discarded by Information Science, it is at least very underestimated by that and moreover it seems that it is completely discarded by the contemporary philosophies of information.

In regard to Information Science there is to say that as far as the production of knowledge increases and the library becomes more and more comprehensive, in the virtual library where to the book is assigned an address as location as well as in the normal library where the books occupy more and more three-dimensional space, the work of the librarian in storing and retrieving information has to be efficient as well as the problem of searching "where information is" becomes the question of searching where the effective information is.

Here I'm holding for the thesis that effectiveness is the other side, in respect to relevance, of the question of the research. In fact I'm holding for the thesis that if compatibility is the servomechanic criterion of computation, as it is and as I have explained in paragraph 2, effectiveness is the human criterion of it (computation). Sure the research is an exquisite human enterprise and effectiveness of scientific theories, if rightly questioned, has to tell us how happens that, at certain time, limited and finite human beings as Euclid for example, and Boole and Descartes and Newton and Maxwell and Boltzmann and Einstein and Heisenberg and Godel and Nash and so forth, discover those laws that compose the scientific theories and that can account for an infinite number of phenomena. As I have already said, it is not my attempt to give here an outline of the informational logic of scientific discovery but what I will outline here is the criterion of effectiveness for humans in respect to their practical and cognitive abilities.

In fact I'm holding for the thesis that effectiveness is the criterion of learning for humans and that it is a criterion that emerges by joining the criteria of the computational and the behavioral architectures. Not only that, in fact I'm holding for the thesis that learning itself is an architecture that emerges by joining the behavioral and the computational architectures.

Learning, which operates to acquire the effective information from the environment to the organizer of that environment for his theoretical and practical tasks, is constituted by a couple of systems: input-output, and by a channel which in the behaviorist approach can be regarded as the memory where information is processed and stored and from where information is retrieved.

We can show what learning is by joining the computational system (blue) with the behavioral system (red) to obtain the system (violet) of learning (fig.12).

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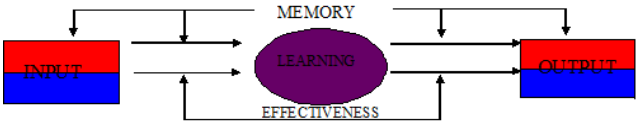


Fig. 12 : The Architecture of Learning

Just this architecture holds for a praxiological approach to the study of learning. Our praxiological approach consists in observing the relation input-output of the system, that is in observing the behavior of the system, and consists in a classification of the learning behavior. Taking in consideration the architecture of the system, learning is classified in effective/non-effective.

The first, most representative and yet actual model of effective information is the Turing Machine. When the idea of computing machine was proposed by Turing the idea was that of outlining an effective method or procedure or algorithm to establish if a problem has or not a solution. From the idea of Turing developed that big line of research that calls computation that roughly simplifying is all about calculus. In fact the formal definition of calculus is regardless of any single calculus and it is absolute, it calls computation. Computation in general has as its objects algorithms and is a theory of effectiveness because any algorithm is an effective procedure, that is a procedure that gives a solution after a finite number of steps. Now this is an intuitive definition and of course the notion of algorithm as well as the notion of effectiveness are human and intuitive notions. In any way today there are a dozen of formalisms, the most important being the Turing Machine, Recursion Theory and Lambda Calculus, stating that the intuitive definition and the formal or mechanical definition of algorithm coincide.

I have already sustained that the criterion of the Finite State Automata is compatibility and not effectiveness, contrary to what is actually believed in the scientific community. At this regard there is to note that the finite state automata are finite engines and they are completely decidable. Practically they output, after a finite number of steps, the answer to the computation and this cannot be otherwise given that they are finite machines. It is to note that being effectiveness a criterion or method to evaluate a procedure as such if it gives an answer after a finite number of steps than it is merely a misconception to elect effectiveness as criterion of the computation of the finite state automata given that they are completely decidable and finite engines and they could not be other than that. In other words, if effectiveness cannot be compared to uneffectiveness, as in the case of the finite state automata, than simply we could drop to speak of effectiveness for this machines and assume compatibility as their criterion.

The things complicate when we take in consideration the Turing Machine which, although being in itself nothing more than an automaton (even if it is the most powerful automaton), it can be thought as a purely abstract automaton with an infinite number of states, which already in the behaviorist approach of Turing's famous paper (1936) were regarded as the memory. Moreover the Turing Machine (M) can be thought as an Universal Turing Machine (UTM) which can be run with a representation of a M(n) and the string w to be processed by M(n). Practically the UTM takes as input every other M. And here the coolest and wonderful problem: the Halting Problem, that is: given an arbitrary Turing Machine M with input alphabet Σ and a string $w \in \Sigma^*$, will the computation of M with input w halts? A solution to the Halting Problem requires a general algorithm that answers the halting question for every possible configuration of M and input string w. But it turns out that the halting question is undecidable. As a result the Halting Problem is undecidable and the Turing machine is semidecidable. That is there is not a procedure to determine if the Machine will halts. If the Machine finds a solution than it will halts, but if it does not finds one it does not halts and it will go searching for the eternity that solution. Turing idea of UTM was so powerful that it represents the architecture of the modern personal computers which are implementations of it (it is to note that in any implementation of UTM the memory is finite) and therefore they are semidecidable machines. It is to note also that the halting problem can be characterized in the field of computational complexity as the NP-complete problem K and certainly it is the first and most famous NP-complete problem.

Now there is to appreciate the Church-Turing Thesis: there is an effective procedure to solve a decision problem if, and only if, there is a Turing Machine that halts for all input strings and solves the problem. There are many instances of the Church-Turing thesis and I have chosen the most general. It is worth enough to note that this thesis works and therefore has been accepted as definition of effectiveness by many, even if not by all scientists. It works because we are facing really a problem of effectiveness given that the problem is to find a solution in a finite number of steps when we do not know if that solution exists and we know that the machine could work in a not finite time. And here the perfect link with cognitive science: supposed that human cognitive processes are effective, than the mind is a Turing Machine. This is the mechanist theory of mind.

Many have criticized this thesis and although in general the mechanism in science has meant progress in all fields of human investigation at least from the birth of modern science until today, nevertheless, the Church Turing Thesis which applies to mathematical objects and of course it is not provable but it is a very practical

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conjecture, when applied to cognitive science becomes an empirical statement highly problematic and strongly dependent on the assumptions of the theorist.

From my action-oriented perspective is strong enough to enlighten something that, it seems to me, really merits to be taken in consideration.

In fact, from the praxiological perspective, effectiveness has to do with action[3] rather than with representation and effective behavior is a matter of degree rather than a matter of all or nothing as it results by the representationalist view. The most part of plants, animals and machines can be assumed as computational agents and their criteria is compatibility. Some high level animals and machines can be assumed as low level learning agents and they can show effectiveness at some low degree. That is to say that just what kind of effective information can be managed depends upon just what kind of device the agent is and upon just what kind of memory the agent is equipped with.

From this praxiological approach learning is an architecture which emerges by joining together the architecture of behavior and that of computation, and its criterion, that is effectiveness, emerges by joining the criterion of computation, that is compatibility and its contrary, and that of behavior, that is activity and its contrary. Effectiveness for human beings is an active behavior in which the object is the source of the output energy involved in a given specific reaction. Effectiveness in machines is a passive behavior in which the object is not the source of the output energy involved in a given specific reaction. The effectiveness of machines and human beings turns not only of a different degree but also of a different level of the classification. In the passive behavior in fact the object is not the source of energy and all its energy in the output can be traced to the immediate input. That is because we should distinguish effectiveness and learning of the machines and humans. Human can show effectiveness in an active and I a passive way. In fact, at least from the great achievement of the father of evolution, Charles Darwin, we know that an action which at the beginning was voluntary and purposeful can be inherited from the next generations and becomes a reflex action which nevertheless does not lose its effectiveness. The inheritance of the machine simply means programmable and of course, after the human discover an algorithm or write a program, being it the Turing Machine itself or some less amazing program, it can be implemented or embodied and followed by a machine, but then it becomes a mechanical and reflex execution which nevertheless does not lose its effectiveness.

Subsequently, the effective behavior, that is learning, is classified in purposeless/purposeful. For purposeful learning is meant that the learning is directed to a goal. In turn the purposeful learning is classified in feedback/non-feedback; and the feedback learning is classified in positive and negative feedback. Again the feedback purposeful learning can be classified in predictive/non-predictive and thus focused at several degrees of complexity (fig. 13).

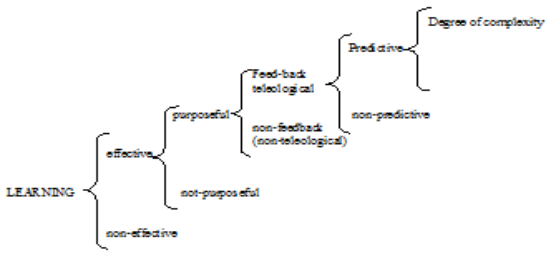


Fig. 13 : Classification of the architecture of learning

In the above classification the first criteria is the peculiarity of the architecture of learning. It is obtained joining together the criterion of the architecture of behavior, that is activity (and its contrary), with that of computation, that is compatibility. Otherwise is quite intuitive that from an active and compatible behavior emerges the learning. This is too the second and still not ultimate answer to the question of where information is: it is in the learning.

It is also understandable that a passive and compatible behavior could result effective.

Nevertheless if this kind of behavior can be considered as learning is still an open question for artificial intelligence.

VIII. The Pluralism of Phenomena & The Integrative Epistemology of Information

At this point the spectrum of colors is complete. Now we have to make a synthesis of all the phenomena (colors) that I have outlined. We have to join the architectures of behavior, communication, computation, information, attention and learning. To do this we need simply to join together the architecture of attention and that of learning (being there all the colors of the

[3]Godel acknowledged already this. In fact Godel (1972a, page 306) in a remark published after his death writes (see also in Blass & Gurevich, pag. 6): "*A philosophical error in Turing's work.* Turing in his [On Computable Numbers], gives an argument which is supposed to show that mental procedures cannot go beyond mechanical procedures. However, this argument is inconclusive. What Turing disregards completely is the fact that the *mind, in its use, is not static, but constantly developing,* i.e. that we understand abstract terms more and more precisely as we go on using them, and more and more abstract terms enter the sphere of our understanding. There may exist systematic methods of actualizing this development, which could form part of the procedure. Therefore, although at each stage the number and precision of the abstract terms at our disposal may be *finite*, both (and therefore, also Turing's number of *distinguishable states of mind*) may converge *toward infinity* in the course of the application of the procedure."

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spectrum) and we obtain the architecture of knowledge (fig. 14). In fact what is knowledge, from a fully operational and action oriented perspective, if not attention and learning?

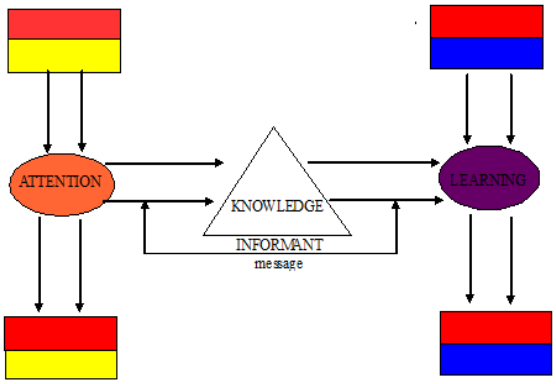


Fig. 14 : The architecture of Knowledge

That drawn above as knowledge is a prism with its three faces: interface, encoding and decoding. But this was already clear by the data Operational Principle. The reader will fully appreciate the effectiveness of the metaphor that I have exploited. In fact, standing to the theory of light, the white light is obtained when all the colors are projected through the prism and vice versa. Standing on this metaphor, knowledge is obtained when all the phenomena are encoded by the actions of human beings and vice versa.

Just this architecture holds for a praxiological approach to epistemology. Our praxiological approach consists in observing the relation input-output of the system that is in observing the behavior of the system and consists in a classification of the epistemic behavior.

Taking in consideration the architecture of the system, knowledge is classified in effective/non-effective and relevant/non relevant information. As a result, knowing is the relevant and effective behavior in which the object (human interface) is the source of the output energy involved in a given specific reaction. That is to say that just what kind of knowledge may be showed by the agent depends upon just what kind of device the agent is and upon just what kind of memory and sensory organs the agent is equipped with. Animals, plants and machine can be assumed as communicational and computational agents and their criteria are connectivity and compatibility. Knowledge with his criteria of effectiveness and relevance is a peculiarity of human beings and may be some high level animals.

It follows that the relevant and effective behavior, that is knowledge, is classified in purposeless/purposeful. For purposeful, effective and relevant behavior is meant that knowledge is directed to a goal. In turn the purposeful knowledge is classified in feedback/non-feedback; and the feedback knowledge is classified in positive and negative feedback. Again the feedback purposeful knowledge can be classified predictive/non-predictive and thus focused at different degrees of complexity.

In the above classification the first criteria are the peculiarity of the architecture of knowledge. They are obtained joining together the criterion of the architecture of attention, that is relevance, with that of learning, that is effectiveness. Otherwise is quite intuitive that from an relevant and effective behavior emerges the knowledge. This is too the complete and ultimate answer to the question of where information is in human beings: it is in the knowledge.

The following criteria are the usual criteria of the praxiological kind. Otherwise it is quite intuitive that knowledge is directed to a goal: wisdom; that it benefits of some negative feedback in the process of achieving its goal; and that it manifests some degree of predictivity: forecasting.

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The Analysis of Back-Feeding Agricultural Legal Relationship

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Abstract - Probing into the connotation as well as the application of the legal relationship can broaden the research category of legal relationship theory and provide the necessary specification guidelines for the evolvement of back-feeding agriculture activities. The formal logic method can successively be used to analyze definition, characteristics, composition of the back-feeding agriculture legal relationship, which is the basis of the applicable solutions for back-feeding agriculture legal relationship in aspect of value, system and content. Back-feeding agriculture legal relationship which has the common characteristics of legal relationship and unique ones based on back-feeding agricultural orientation is the combination of administrative relationship, collaborative relationship and autonomous relationship whose main content is rights and obligations. These unique features are emerged from the subjects and the content of back-feeding agriculture legal relationship, while these unique ones behave differently along with the different objects. Community theory and benefit allocation mechanism can be used to analyze its application in terms of legislative spirit. In a similar way, systematization of normative legal documents should be used to analyze its application regard to legislative form, while the design of legislative norms to analyze its application in the field of legislative content.

Keywords : *back-feeding agriculture; legal relationship; connotation; application.*

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The Analysis of Back-Feeding Agricultural Legal Relationship

Xu Heng [α] & Zhao Qian [σ]

Abstract - Probing into the connotation as well as the application of the legal relationship can broaden the research category of legal relationship theory and provide the necessary specification guidelines for the evolvement of back-feeding agriculture activities. The formal logic method can successively be used to analyze definition, characteristics, composition of the back-feeding agriculture legal relationship, which is the basis of the applicable solutions for back-feeding agriculture legal relationship in aspect of value, system and content. Back-feeding agriculture legal relationship which has the common characteristics of legal relationship and unique ones based on back-feeding agricultural orientation is the combination of administrative relationship, collaborative relationship and autonomous relationship whose main content is rights and obligations. These unique features are emerged from the subjects and the content of back-feeding agriculture legal relationship, while these unique ones behave differently along with the different objects. Community theory and benefit allocation mechanism can be used to analyze its application in terms of legislative spirit. In a similar way, systematization of normative legal documents should be used to analyze its application regard to legislative form, while the design of legislative norms to analyze its application in the field of legislative content.

Keywords : back-feeding agriculture; legal relationship; connotation; application.

I. Introduction

The back-feeding agriculture which is the objective need of social development after the realization of industrialization has multiple missions, such as balancing urban and rural development, optimizing the industrial structure and keeping the social justice. As to our country, the fact that agriculture "feeds" industry for a long time and the situation that industrial output has far exceeded agricultural output are the realistic basis of back-feeding agriculture. Hence, the back-feeding agriculture has been paid wide attention by the theoretical circle and the practical circle in recent years, while the relevant research results and the institutional facts have continuously been in public view. Legal relationship refers to “social relations whose content is the rights and obligations, built and adjusted by the law”[1].The attributes of legal relationship, such as normalization, comprehensiveness, mandatory, integrity. It has marked the social relationship with the brand of “the orderly, the controllable, coordination”. [2] The exploration of the back-feeding agriculture legal relationship can not only broaden the related theory of research categories for legal relationship, but can also provide necessary specification guidelines for the evolvement of back-feeding agricultural activities. Nevertheless, the paradigm discussing the problems of back-feeding agriculture from the perspective of legal relationship and even the science of law has rarely been seen so far in the academic circle. Few related research is limited to the rights nurturing and the back-feeding agriculture legal concept, etc. Research on the connotation and application of back-feeding agriculture legal relationship would show its theoretical value and practical significance to a higher degree.

II. The Connotation of the Back-Feeding Agriculture Legal Relationship

To clarify the logical form and discipline of back-feeding agriculture legal relationship, the method of formal logic can be used to research the connotation of the back-feeding agriculture legal relationship. “Concept is the form of thought which reflects inherent attributes (or nature) of things. When the concept reflects the specific attribute of things, it can also reflect these unique things per se. The connotation of the concept is the specific attributes reflected by the concept." [3] The connotation of the back-feeding agriculture legal relationship is the specific attributes of the legal relationship reflected by a concept of the legal relationship, as the unique attributes tend to show three aspects: definition, characteristics and formation.

a) The Definition of the Back-Feeding Agriculture Legal Relationship

As an entity, back-feeding agriculture legal relationship, the performance results of legal relationship lying in back-feeding agriculture, is a kind of specific and specialized legal relationship, which has the similarity of legal relationship itself and the particularity of back-feeding agriculture; As a "category"[4], it is a combination concept in which "back-feeding agriculture" is prefix-title of "legal relationship" . Only on the basis of the concept of legal relationship, can we accurately delimit back-feeding agriculture legal relationship.

Since Savigny first proposed the definition that “the legal relationship is the interrelationship of people

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defined by the law"[5], the study of the definition of legal relationship has become a practical and popular learning and has reached some consensus in academic circle. Such that "Legal relationship is the relationship of the rights and obligations via the process that legal norms regulate people's behavior. Its constituent elements include: (1) the subject of rights; (2) the rights and obligations; (3) object of the rights."[6] "Legal relationship refers to the relationship of social life or the relationship of rights and obligations via certain legal facts confirmed or regulated by law." [7] In addition, different discipline gets to different understanding based on its own research paradigm. Jurisprudence academic circles generally defined legal relationship as "the affiliation of rights and obligations between people produced in the process of legal norms' guiding people's behavior and regulating social relationship, as well as the combination of social content and legal formation."[8] The definition attaches more emphasis on legal relationship existed in interpersonal relationship and social relationship, whose nature is determined by the nature of the social life and the actual contact. The legal relationship so defined often has the characteristics of fundamentality, abstractness, normalization and legitimacy. Civil law academic circles usually defined legal relationship in the perspective of civil legal relationship, such as "The civil legal relationship is the civil relationship of rights and obligations based on civil legal facts and the regulation of civil legal norms, which is the legal reflection of the property relationship and the personal relationship altered by civil law among equal subjects." [9] the definition typically illustrates the causes, the precondition, the main contents and the regulative range of the legal relationship. The legal relationship so defined has the feature of normalization, legitimacy, nay, the characteristics of subject equality and value creativity. Criminal law academic circles usually define the legal relationship in the angle of criminal legal relationship, such as "the criminal legal relationship includes criminal law relationship, criminal procedure legal relationship and criminal execution legal relationship, or includes the criminal entity legal relationship, the criminal programmed legal relationship and crime alternation legal relation."[10] The legal relationship so defined returns to the nature of legal relationship of a kind of social relationship, which highlights that the organic combination of the entity relationship, the procedure relationships and the execution relationship could better promote the good operation of the social relationship. Administrative law academic circle usually defined the legal relationship in the range of administrative legal relationship, such as "administrative legal relationship refers to the relationship of rights and obligations regulated by administrative law among the administrative subject, administrative personnel and administrative counterpart due to the implementation of the national administrative power"[11]. The legal relationship so defined completely covers all kinds of related subjects (administrative subject, administrative personnel and administrative counterpart), which illuminates us to define it in the perspective of the people in social relationship. Economic law academic circle usually defined the legal relationship in the perspective of economic legal relationship, such as "the relationship of rights and obligations formed in the process of restricting the qualifications of market subject, regulating the market order, carrying on macroeconomic regulation and supervising economy among the economic law subjects corresponding to the economic law by the state."[12] The legal relationship so defined focuses more on the facts and behavior of social relationship which is the basis of various objects (the qualification of market subject, market order, macroeconomic regulation and supervision) concerned with the social relationship.

Above all, the academic circle has reached a basic consensus on some categories attached to the concept of legal relationship, such as legal norms, rights and obligations, social relationship. The fact that government agencies lead the back-feeding agricultural activities and the mission of macroeconomic regulation and balancing urban and rural economic development back-feeding agriculture shoulders on determine the attribute of back-feeding agriculture legal norms which is mostly a kind of comprehensive legal norms, mainly for the combination of administrative legal norms and economic legal norms. To scientifically define the concept of back-feeding agriculture legal relationship, we might as well take the consensus conceptual category of legal relationship in academic circles as the foundation, combined with the basic features of back-feeding agriculture legal norms. Back-feeding agriculture legal relationship refers to the combination of various administrative relationship, collaborative relationship and autonomous relationship whose main content is the rights and obligations among the administrative subject, administrative personnel and administrative counterpart formed in the process of regulating and adjusting the financing behavior by back-feeding agriculture legal norms.

b) The Characteristics of the Back-Feeding Agriculture Legal Relationship

i. *The Common Features*

Back-feeding agriculture legal relationship, of course, has the universal characteristics that legal relationship has in common, such as "the social relationship formed in accordance with law, interpersonal relationship, the relationship of rights and obligations, the unity of social content and legal form, in the protection of the state coercive power, the attributes of ideological and motivate relationship"[13] Firstly, the back-feeding agriculture legal relationship should be the

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combination of various administrative relationship, collaborative relationship and autonomous relationship formed in accordance with back-feeding agriculture legal norms. The back-feeding agriculture legal norms are supposed to be regarded as a generalized definition whose range is not limited to agriculture legal norms but legal norms concerning back-feeding agriculture included. Secondly, the back-feeding agriculture legal relationship is also the interpersonal relationship. The people here also should have a broad understanding, in addition to the peasants, also including the personnel of relevant government agencies, agricultural institutions, productive and operative organizations and other relevant social organizations (agricultural industrialization organizations such as agricultural technology popularization association, the capital mutual-aid association, the rural human capital training institutions and cooperatives) . Thirdly, back-feeding agriculture legal relationship is the relationship of rights and obligations among back-feeding agricultural subjects, also including various back-feeding agricultural power and legal liabilities. The relationship of rights and obligations is the key factors to distinguish from habitual relationship, moral relationship and religious relationship. It is the various rights and obligations legal norms endow back-feeding agricultural subjects that generate back-feeding agriculture legal relationship. Fourthly, the back-feeding agriculture legal relationship is the combination of back-feeding agricultural practice and back-feeding agriculture legal norms. The back-feeding agricultural practice determines the nature of the back-feeding agriculture legal relationship, while the back-feeding agriculture legal relationship in turn dresses back-feeding agricultural practice with rights and obligations. The objective existence and the interaction of the two factors necessarily give birth to the back-feeding agriculture legal relationship. Fifthly, back-feeding agriculture legal relationship is the administrative relationship, collaborative relationship and autonomous relationship whose implementation is guaranteed by the state coercive power behind back-feeding agriculture legal norms. Any individual or organization shall not violate or break the legal relationship before attaining the admission of the other subjects legally, while relevant government agencies have the right to require the voluntary subjects to perform its obligations and give legal sanctions to those who don't perform its obligations. Sixthly, back-feeding agriculture legal relationships also have the attributes of ideological and motivate relationship, which is the unity of the material relationship and ideological relationship. As a kind of material relationship, the back-feeding agriculture legal relationship has reflected the content of the economic foundation, such as laborer, labor relationship and productive mode. As a kind of ideological relationship, the back-feeding agriculture legal relationship has also reflected administrative relationship and spiritual relationship, such as the leading function of government, agricultural intellectual property rights, etc.

ii. *The Unique Features*

Back-feeding agriculture legal relationship have the six aspects of universal characteristics, nay, it has the unique features based on the characteristics of back-feeding agriculture itself. Back-feeding agriculture refers to "the activities to realize the modernization of agricultural production, promote rural economic development, and increase farmers income levels by through non-agricultural industries, the support cities provide in accordance with characteristics of back-feeding agriculture under the guidance of the national industrial policy"[14]. Back-feeding agriculture includes capital nurturing, technology nurturing, human capital nurturing and industrialization nurturing, etc. Its unique characteristics can be mainly expressed as policy dependence, specification compound, and discipline connection. Firstly, policy dependence, the building and application of back-feeding agriculture legal relationship is in line with policy guidance of national industry nurturing agriculture, coordinating urban and rural development, which should be adjusted with the change of policy. The change of related policy also has much timeliness that clarifies that the building and application of back-feeding agriculture legal relationship has obvious value only during the period of the medium-term of industrialization and the existence of urban and rural dual structure. Secondly, the specification compound, it namely refers that the legal norms involved in back-feeding agriculture legal relationship is cross sect oral law, including the administrative law, economic law, civil law, criminal law and social law, in which administrative law and economic law relating to agriculture is the core elements. The specification compound also determines the diversity of legal relief ways, among which the relief ways, such as administrative litigation, administrative reconsideration, public Interest Litigation, small claims, in different sect oral law could be applied accordingly to protect the related legal interests. Thirdly, discipline connection. It namely refers that the back-feeding agriculture itself is a kind of public policy activity wanting multi-disciplinary knowledge to nurture agriculture, which determines that the building of back-feeding agriculture legal relationship need integrate multi-disciplinary knowledge, such as the water conservancy, machinery, law, finance, the plant protection, management, etc. Discipline compound also determines the complexity of the back-feeding agricultural practice, which illuminates that the mode of limited-subjects nurturing and traditional administrative nurturing is difficult to achieve the desired effect. Efforts should be made to the innovation of nurturing mode in the back-feeding agriculture practice, by through inter-departmental integrated nurturing,

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professional cooperatives nurturing, agricultural enterprises nurturing, public-welfare fund nurturing, service nurturing bought by government to realize the compound of back-feeding agriculture. These unique features get to be apparent through the subjects and contents of back-feeding agriculture, and vary with the different objects.

c) The Composition of the Back-Feeding Agriculture Legal Relationship

i. *Subjects*

The subject of the legal relationship is the precondition of survival of legal relationship, and is also the most dynamic organization in legal relationship. Existence and operation of the entire legal relationship totally depends on the support of subjects, while the endowment of rights and obligations, the inheritance of authority and responsibility, the protection of objective interests are all closely related to the subjects. The subject of back-feeding agriculture legal relationship is also the precondition of back-feeding agriculture legal relationship, and the owners and bearers of back-feeding agriculture legal relationship. The subjects of back-feeding agriculture legal relationship mainly include: government and administrative agencies, agricultural institutions, productive and operative organizations, other related social organizations and farmers.

Three kinds of relationship including the managing-managed relationship, competition-collaboration relationship and market-autonomy relationship have been fundamentally formed among the subjects. Administrative agencies and other nurturing subjects should form the managing-managed relationship in which administrative agencies must supervise the agricultural institutions, productive and operative organizations, other related social organizations and farmers effectively. Agricultural institutions, productive and operative organizations and other related social organizations mainly formed the competition-collaboration relationship which consists of the mentoring relationship between the higher agricultural institutions and subordinate units, the competitive relationship formed in the process of bidding the project among enterprises, the collaborative relationship among organizations via comprehensive nurturing and the funding-support relationship between financial-group legal person and the subjects. Agricultural institutions, productive and operative organizations, other related social organizations and farmers mainly formed the market-autonomy relationship in which policy preference should be made to realize the economic development and group harmony in accordance with the value rule.

ii. *Contents*

The content of legal relationship mainly includes two aspects: the rights and obligations of private subjects, the power and responsibilities of public authorities. The clarification of the content of legal relationship directly affects the improvement of the legal relationship theory and the effect of legal application in the related field. The content of back-feeding agriculture legal relationship is also the core element of the back-feeding agriculture legal relationship. The rights and obligations of the productive and operative organization, other social organizations and farmers in the back-feeding agriculture legal system is included, as is the power and responsibilities of relevant administrative agencies and agricultural institutions therein.

First of all, in terms of the rights of private subjects, productive and operative organizations, other relevant social organizations' and farmers' rights mainly include autonomous power of the application of scientific and technological achievements, the unconditional possession of agricultural subsidies, the assistance for agricultural technological accident, the reward for the promotion of back-feeding work, the relief of reconsideration and lawsuit initiated for the infringement or unfair treatment in the process of back-feeding agriculture. Its corresponding obligations include the obligation to implement the back-feeding agriculture policies, the duty to coordinate the public authorities with the work of comprehensive nurturing, the liability of complying with back-feeding agriculture legal norms, the responsibility of exposing the destructive deeds to back-feeding agriculture, the compulsion to abide by the transaction order of compensation for equal value, the rule for resisting the monopoly of nurturing resources.

Secondly, in terms of public authorities, the power of relevant government agencies and agricultural institutions in the nurturing activities mainly includes the coordinated guarantee of government for the promotion of back-feeding agriculture, the power of application for nurturing funds, the power of collecting nurturing opinion, the power of organizing hearing, the advising and organizing power of nurturing units at higher levels. Its relevant responsibilities mainly include the responsibilities to make and implement nurturing public policy, the responsibilities of propaganda of nurturing achievements, the liabilities to allocate nurturing funds on time, the obligations to arrange the nurturing resources reasonably, the duty of carrying out the work of nurturing in accordance with the Constitution and law, the compulsion to build the nurturing effect-feedback mechanism.

iii. *Objects*

The objects of legal relationship refer to the legal interests to be damaged by violations under the protection of legal norms. The objects mainly include the substance, behavior, intellectual property, and order, etc. The objects of back-feeding agriculture legal relationship refer to the legal interests under the

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protection of relevant legal norms in the process of back-feeding agriculture. As same as the objects of other legal relationship, the objects of the back-feeding agriculture legal relationship also have the characteristics of availability, controllability and objectivity. Simply put, the objects of the back-feeding agriculture legal relationship can be summarized as substance, behavior, spiritual product and order.

The substance in back-feeding agriculture mainly refers to the object in form of kind which is necessary for nurturing activities, such as agricultural machinery, seed, fertilizer, animal and plant species ,cash payments. The behavior in the legal relationship mainly refers to the concrete administrative behavior, cooperative behavior and autonomous behavior existed in the process of capital nurturing, technology nurturing, human capital nurturing and industrialization nurturing. The spiritual products in the legal relationship refers to the intangible technological achievements generated by mental work and expressed in certain forms for the back-feeding agriculture, such as new irrigation technology, grafting and hybridization technology, rural literature, etc. Such spiritual products belong to a kind of invisible ideology; nevertheless they also depend on certain carriers (such as drawings, Animation, slides, etc.). The order of back-feeding agriculture refers to the combination of the orderly behavior and social relationship generated by the interaction between the operation of relevant nurturing legislation and the elements in social life, such as political elements and economic elements. It can mainly be expressed as the administrative order between relevant administrative agencies and other subjects, the collaborative order among agricultural institutions, productive and operative organizations, other relevant social organizations, and the autonomous order among agricultural institutions, productive and operative organizations, other relevant social organizations and farmers.

III. The Application of the Back-Feeding Agriculture Legal Relationship

Back-feeding agriculture legislation, as a kind of normative documents adjusting the financing activities, is a collection of related behavior rules or norms, and the basic function is to “make human’s numerous, various and different behavior and relationships achieve an order to a reasonable degree” by limitations to actions or behavior[15]. We can conclude that the back-feeding agriculture legal relationship should be one of the objects of the normative documents. Clarify the application back-feeding agriculture legal relationship can provide more realistic and concrete indications for scientific construction of back-feeding agriculture legislation. “The main content of the real law and natural law can be summed up in three basic aspects, namely moral principles and value orientation, the discipline and the nature of matters. Ethical nature, regularity and characteristics of these three aspects are presented by legal spirit, forms and contents.” [16]In legislation which is the subordinate concept of law, the legal spirit, form and content present as legislation value, legislative content and legislative system. To explore suitable path of the back-feeding agriculture legal relationship, we might as well start from the value, system and content of the back-feeding agriculture legislation.

a) The Value Application of Agriculture Legal Relationship

Value generally refers to the object’s usefulness for the subject. Application generally refers to proper use (including the construction of execution, feedback and relief mechanisms). So "value application" can be generally understood as "how to operate more effectively". To explore the value application of back-feeding agriculture legal relationship, we should both reveal the general value of law and explore the effective auxiliary operation mechanism. For the former, we can make community theory an index. For the latter, we can make profit allocation mechanism as a breakthrough. In the legislation of back-feeding agriculture, the application of back-feeding agriculture legal relationship can be analyzed from the aspects of community theory and profit allocation mechanisms to make the constituent elements of the relationship present better in the value of legislation.

i. *The Application of Back-feeding Agriculture Community*

Community theory is a classical theory of western sociology and political science, which built the community model that highly summarized the development of past political, economic and cultural system. German sociologist Ferdinand Tonnies made a systematic exposition of "community" for the first time. “Community is based on relevant personnel’s instinctive love or adaptation of habit or collective memory associated with thoughts. Community is a kind of lasting and real common life and it is the perfect unity of man's original or natural state will."[17] The essence of community life is a kind of thinking, awareness and actions with certain purposes interacted between different individual's lives. Community theory stresses interaction and cooperation between community members, and back-feeding agriculture legal relationship is the combination of administrative relationship, collaborative relationship and autonomous relationship. They have natural purposiveness and communion. Back-feeding agricultural community is the requirement of back-feeding agricultural legal relationship’s application to the field of back-feeding agricultural legislation spirit. Based on back-feeding agricultural legal relationship, building the back-feeding agricultural community under the guidance of back-

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feeding agricultural legislation contributes to put back-feeding agricultural legal relationship's subjects and content into practice. On one hand, through stabilization and concretion of back-feeding agricultural community members can facilitate different parties of back-feeding agricultural legal relationship's accurately position and oriented organic unity. On the other hand, through interaction and cooperation according to law between back-feeding agricultural community members can promote different parties of back-feeding agricultural legal relationship more actively to achieve its corresponding rights, obligations, or power and responsibilities, thus facilitating static elements of back-feeding agricultural legal relationship conversion to dynamic reality of back-feeding agricultural activities. Probing into the back-feeding agricultural community should combine law's order value and freedom value and achieve community members' full freedom together on the premise of organic order. Should not only safeguard the back-feeding agricultural efficiency, but also respect the back-feeding agricultural community members' free will, avoid community members' aimlessly and mechanical passively invalid labor. Through the innovation of back-feeding agricultural form, optimizing autonomous collaboration relationship between back-feeding agricultural community members, leading community members' reasonable competition within law's framework, improving the community dispute relief way, then we realize the orderly and freely construction of back-feeding agricultural community.

ii. *The Application of the Back-Feeding Agricultural Benefit Allocation Mechanism*

Rawls's principle of justice is a category related to benefit allocation. The first principle is called the biggest equal freedom principle: each person is to have an equal right to the most extensive basic liberty compatible with a similar liberty for others. The second principle is also called the difference principle: the least-advantaged members of society should have the greatest benefit in order to solve social and economic inequalities. [18] The first principle of justice requires each person have an equal right and the second principle of justice puts emphasis on the moderate care for vulnerable groups. Back-feeding agriculture itself is the rectification of imbalance between urban and rural development in the process of social transformation in our country. In the process of back-feeding agricultural benefit allocation guided by back-feeding agricultural legislation we should give full play to the basic spirit of the second principle of justice. And under the premise of equality of resources allocation and limited power, we should put emphasis on giving relatively weak in poor areas, poverty unit and population living under poverty line tilt and special care. In this way, different parties of back-feeding agricultural legal relationship, especially farmers in a relatively weak position can be convinced that back-feeding agriculture is a kind of realization of benefit allocation justice activities, thus more proactive and consciously safeguard various legal interests protected by back-feeding agricultural legal relationship, exercise rights according to law, conscientiously perform their obligations, and finally the true freedom of different parties of back-feeding agricultural legal relationship can be realized. So, building the back-feeding agricultural benefit allocation mechanism based on principles of justice can help the elements of ideal state of back-feeding agricultural legal relationship conversion to the elements of factual state, and finally realizes the back-feeding agricultural legislation's basic values such as justice, efficiency, order and freedom. Probing into the back-feeding agricultural benefit allocation mechanism should combine law's justice value and efficiency value, safeguard reasonable allocation of back-feeding agricultural resources and raise the enthusiasm of subjects of back-feeding agricultural legal relationship. By opening and equalization of back-feeding agriculture opportunities, publicizing back-feeding agricultural benefit allocation rules, adhere to the basic equal distribution principle, tilting back-feeding towards poor areas, attaching importance to the rightness and feasibility evaluation of back-feeding agricultural projects, improve the feedback mechanism of disagreements over benefit allocation, building back-feeding agriculture incentive and punishment mechanism we can build back-feeding agricultural benefit allocation mechanism based on the principles of justice.

b) The Systematic Application of the Back-Feeding Agriculture Legal Relationship

Systematization of normative legal documents is an important method of combing the legal norms, also applicable as a supplementary institutional design for legal relationship. The application of back-feeding agriculture legal relationship in the field of back-feeding agriculture legislation can be analyzed in the perspective of systematization of normative legal documents which includes back-feeding agriculture legal clean-up, back-feeding agriculture codification, back-feeding agriculture compilation, so as to promote the constituent elements of back-feeding agriculture legal relationship better appeared in the legislative system.

i. *The Application of Back-Feeding Agriculture Legal Clean-Up*

"Legal clean-up, also known as the regulations finishing, is a law-making activity. It is a form of legislation referring to the relevant national authorities in accordance with certain procedures, reviewing normative legal documents for a certain period of time and scope and re-determining its legal effect activity."[19] In this process, the old laws and regulations are repealed or modified while the new legal

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norms are created. Conducting back-feeding agricultural law clean-up can effectively alleviate the inherent lag and rigidity of nurturing agriculture and legal norms to adapt to changing social reality in a better way. Modified in 2012, the People's Republic of China Agricultural Technology Promotion Act, Article 13, by the township level, the proportion of technical positions at the county level and other agricultural technology promotion agencies 100%, 80% and 70% of strict quantitative requirements, more conducive to the realization of the grassroots agricultural extension agencies streamline, efficient and attract talent to curb the phenomenon of grassroots agricultural extension agency personnel constitute a fish, to ensure that the limited nurturing agriculture funds to the letter. Making up industry nurturing agriculture legislation is typical in the clean-up process but also nurturing agricultural legislation gaps.

ii. *The Application of Codification of the Back-Feeding Agriculture Law*

The law codification, also known as codification "means the state legislature will belong to all existing normative legal documents of a legal department to clean up and modify, create new norms, to modify unsuitable specification repealing outdated norms, compiled harmony, complete and systematic style of new laws or codes."[20] The codification is the highest form of legislation, which allows all of the legal norms of the legal department coordinate with each other and form a complete system. To codify back-feeding agriculture legal norms means back-feeding agricultural legislation as an independent department law system, although the need to become an independent department law system is questionable, but of all kinds of relevant nurturing agriculture laws and regulations integration is necessary. To nurturing agricultural problems, may develop high-order administrative regulations more specific legislation to achieve the goal of unified regulating, in order to solve the conflict and overlap of relevant nurturing agriculture laws and regulations. Several legal norms closely related to the nurturing agriculture, such as Agricultural Law Agricultural Technology Promotion Act, the Land Management Law, Agricultural Machinery Promotion Act, Rural Land Contracting and Management Disputes Mediation and Arbitration Law, Land Contract Law, Agricultural Cooperatives Law, can be unified and integrated to prepare for an Agriculture (or Nurturing Agriculture) Code, to provide a more systematic specification guidelines for the application of back-feeding agriculture legal relationship.

iii. *The Application of Compilation of the Back-Feeding Agriculture Law*

The compilation of Law does not belong to the legislative or law-making activities. "It means the normative legal documents in accordance with a certain degree of purpose or standards, such as the field adjusted by social relationship, class or nature of the problem, in accordance with the level of effectiveness, in chronological order, to make the system arrangement and compiled into a book."[21] Back-feeding agriculture law compilation is to take agriculture-related laws and regulations compiled into a book, whose main purpose is to facilitate the more comprehensive and systematic understanding of legal relationship between the subjects of nurturing agriculture, to look up relevant nurturing agriculture laws and regulations accessibly, to promote the upgrade of public cognition and evaluation capacity of back-feeding agriculture, and by the positive Franco-Prussian publicity, enforcement according to law, consciously abide by the law and other forms, participation in back-feeding agriculture activities can be effectively promoted. Present back-feeding agriculture compilation mainly includes "agricultural laws and regulations compilation" of China Agriculture Press, published in 2003; "the Agricultural Code of the People's Republic of China" of Law Press, published in 2011.On the whole, it has the shortcomings of a slow updates and few varieties. The establishment of the electronic platform of open-source agriculture (or nurturing agriculture) legal compilation is the best choice to solve the problem in the information age.

c) The Content Application of Back-Feeding Agriculture Legal Relationship

Back-feeding agriculture legal relationship is built on the premises of the back-feeding agriculture legal norms, and the research on the content of back-feeding agriculture relationship is essentially a kind of correction and innovation on the back-feeding agriculture legal norms. Based on the angle of soft law norms, referee norms and evaluation norms, analyzed in the perspective of the design of legal norms, the components of the back-feeding agriculture legal relationship can be better revealed in legislative content.

i. *The Application of the Back-Feeding Agriculture Soft Law Norms*

Nowadays, China's jurisprudence "paradigm" [22] is still a formulary which is, back to Austin, analysis of the traditional "hard law" law research paradigm, the long-term neglect of the research and application of "soft law". The so-called hard law refers to those behaviors that command obedience in national legislation mode, which can use the state coercive power to ensure implementation of legal norms. Soft law which refers to its validity does not come into effect in accordance with the state coercive power to ensure implementation of the law." [23] The implementation of "soft law governance, unity of the hard and soft" mode of mixed legal system, can maximize the integration of

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national and social autonomy, a mandatory two kinds of function. Applying soft law norms to back-feeding agriculture legislation can effectively mobilize public right and private right subject two aspects of motivation, and receive comprehensive response to diverse back-feeding agriculture legal relationship subjects in order to realize the diversification of the back-feeding agriculture interests appealing. Back-feeding agriculture soft law norms as the financing of legal norms, which stresses more consultation, less compulsion and higher freedom, can be formed the organic inner link of various management relationships, cooperation and autonomy as the sum of the back-feeding agriculture legal relationship. With respect to the objects which has weak subjectivity and strong objectivity (such as substance, spiritual products), soft law of high flexible adjustment can save limited institutional agricultural resources, and help to eliminate the breeding of local or industry unspoken rules and also to improve the level of the back-feeding agriculture under the rule of law. With respect to weak the object of subjectivity, strong objectivity set by the back-feeding agriculture soft law regulating mechanism, it strengthens the social autonomy function of the back-feeding agriculture legal relationship in effective way.

ii. *The Application of Back-Feeding Agriculture Referee Specification*

"Jurisdiction based on law" and "jurisdiction based on discretion" are the concepts put forward by American famous social jurist Roscoe Pound. The Jurisdiction based on law refers to carrying on judicature according to authoritative imperative, norms and instructions, while the jurisdiction based on discretion refers that the judge can apply discretion to cases. [24] The role of "jurisdiction based on law" lies in maintaining the stability of the law, avoiding its constantly changing, endowing people a sense of security being protected by law. The role of "jurisdiction based on discretion" can be expressed as taking social practice and reasonable expectation into the verdicts via the discretion of judges to enable the law to keep pace with the age. Back-feeding agriculture referee specification should balance the "jurisdiction based on law" and "jurisdiction based on discretion" in order to reconcile the contradiction between the legislative stability and factual variability of back-feeding activities. Back-feeding agricultural legislation may not solve all the problems of back-feeding agriculture, which enlightens that we can't apply the specification equally and completely. Back-feeding agriculture referee specification should provide the necessary discretion space for the solution to relevant disputes so that the application of nurturing legislation will be more suitable for national conditions, public opinion and social development. It connects the latest nurturing policy, practice, interests demand with the rights and obligations of various subjects in order to provide specific solution to solve the distributes.

iii. *The Application of Back-Feeding Agricultural Evaluation Specification*

The "dichotomy" theory including the ideal state and the factual state which is an important symbol of Analysis School is first put forward by Jeremy Bentham, then by Austen's inheritance and development. In essence, the "dichotomy" theory is two kinds of research angle of the legal norms. The first angle can be realized as "what the law should be" which belongs to the ideal state, while the other can be expressed as "what the law on earth is" which is known as the factual state[25]. The back-feeding agriculture evaluation specification should be designed on the basis of the "dichotomy" theory. On one hand, the back-feeding agriculture legal norms which are in line with the rational and moral standards should be made in the angle of the ideal state of the back-feeding agriculture legal relationship and even the nurturing legislation. On the other hand, so as to explore the scientific and feasible solutions, the factual dilemma of the rights and obligations of various subjects and the legislative defect expressed in the process of implementing the nurturing norms are supposed to be analyzed in the angle of the factual state of the back-feeding agriculture legal relationship and even the nurturing legislation. We should make the distinctive conclusion by the static analysis, also via the value judgment of content design and technological application of the nurturing legal norms on the basis of legal text. We should also make the positive or negative conclusion by the dynamic analysis, also via the value judgment to the actual utility of the nurturing legal norms on the basis of legislative function.

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Implementing a Home-Based Health Care Programme for the Children with Heart Diseases from the Rural Areas in Namibia: Making a Difference in Coping with the Demands of Care at Home

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Abstract - The purposes for the implementation of a homebased health care programme interventions was to empower the caregivers of children with heart diseases from the rural areas in Namibia, and the children alike for them to employ constructive coping methods, access community-based resources and implement care interventions which enhance positive health outcomes for their children concerned and therefore, to facilitate caregivers' coping with the demands of care at home. Therefore, a qualitative outcomes evaluation was conducted three months after the implementation of the programme interventions to assess the long-term effects of the programme interventions on the participants. The findings indicated that the caregivers and the children with heart diseases gained knowledge about the child's condition, skills for providing care at home as well as information about community-based resources that can provide them with support to cope. In conclusion, if sustained for a long-term, the programme interventions can make a difference in coping with the demands of home care for the caregivers of children with heart diseases from the rural context. This paper describes the processof implementation of a home-based health care programme intervention, and the subsequent outcomes of the programme evaluation.

Keywords : *heart diseases, home-based health care, interventions, implementation, evaluation, outcomes, coping.*

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Kristofina Amakali [α] & Louis F. Small [σ]

Abstract - The purposes for the implementation of a home-based health care programme interventions was to empower the caregivers of children with heart diseases from the rural areas in Namibia, and the children alike for them to employ constructive coping methods, access community-based resources and implement care interventions which enhance positive health outcomes for their children concerned and therefore, to facilitate caregivers' coping with the demands of care at home. Therefore, a qualitative outcomes evaluation was conducted three months after the implementation of the programme interventions to assess the long-term effects of the programme interventions on the participants. The findings indicated that the caregivers and the children with heart diseases gained knowledge about the child's condition, skills for providing care at home as well as information about community-based resources that can provide them with support to cope. In conclusion, if sustained for a long-term, the programme interventions can make a difference in coping with the demands of home care for the caregivers of children with heart diseases from the rural context. This paper describes the processof implementation of a home-based health care programme intervention, and the subsequent outcomes of the programme evaluation.

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I. Introduction

Providing care for a child with heart disease could be a daunting task for any caregiver, particularly for those living in poor conditions in rural Namibia. Likewise, the data from a qualitative, exploratory, descriptive and contextual study that describes the experiences of providing home care for a child with a heart disease by the Namibian rural caregivers has revealed poor coping with the demands of caring on the part of the caregivers, while the children's poor coping with the burden of the disease compounds the demands of caring on the part of the caregivers (Amakali, 2012). As a result, a home-based health care programme with multi-components interventions was developed for implementation to mitigate the negative experiences, and to provide caregivers with the knowledge and skills for them to provide appropriate home care that facilitates positive health outcomes for the children concerned (Amakali, 2012).

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II. Purpose of the Study

This paper describes part of the study on assessing the need for a home-based health care programme in support of the caregivers of children with heart diseases from the rural area in Namibia (Amakali, 2012).For the context of this paper, the study purposes are of two folds. The first purpose was to implement the interventions of a home-based health care programme to facilitate caregivers from the rural areas in Namibia to learn knowledge and skills necessary for them to provide appropriate home care for their children with heart diseases. In addition, the study aimed at validating the potential long-term effects as outcomes of the programme interventions on the recipients.

a) Study Design and Methods

A qualitative, descriptive study was conducted to implement the interventions and evaluate the outcomes of the interventions respectivelyin the same subjects (Burns & Grove, 2001). The study was conducted in two phases. Phase one entails the implementation of home-based health care programme interventions to empower the caregivers in order for them to cope with the demands of providing home care for their children with heart diseases. Phase two entails the outcome evaluation of the programme interventions and the recommendations.

III. Phaseone: Implementation of the Programme Interventions

a) Study Population

The study population on whom the study findings can be generalized were all the Namibian rural

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caregivers of children with heart diseases who were receiving treatment at the public health care facilities in Namibia.

b) Sample and Sampling

A sample of two households, each with a child with a heart disease and the caregiver(s) and headed by the subsistence agricultural farmersin the rural Omusati region of Namibia were purposefully selected to participate as the recipients of the programme interventions which aim at empowering caregivers to cope with the demands of home care to a child with a heart disease. The two households were purposefully selected from the total sample of those households which participated in the situational analysis and the identification of the need for facilitation of coping with the demands of home care for the caregivers.In observation of ethical codes, informed consent for voluntarily participation on the part of the participants was observed (Parahoo 2006).

c) Process of Programme Implementation

The interventions for the aforesaid home-based health care programme were implemented through workshops at two of the rural householdswhich participated in the situational analysisthat identified poor coping with the demands of home care and as such, the need for the home-based health care interventions to facilitate coping with home care on the part of the caregivers. The programme interventions were therefore implemented at the participants' households while taking into account the socio-economic and cultural aspects that could have influenced the outcomes of the programme interventions and was therefore adjusted to the educational level of the caregivers to allow them to understand both the information and practical experiences from the programme interventions (Paul, 2008)(see figure 1). The purpose of the individualised household programme interventions was to maximise the benefits for each participant or the family unit, therefore for them to benefit from the proposition that the clients of health services tend to learn better in their home environment than in health care facilities (Sorenses, Pinquart & Duberstein, 2003; Lepscyzyk, Laleigh, & Rowley, 1990).

In this regard, sessions of different interventions were implemented. Session one focused on interventions for facilitation of emotion focused coping and addressed aspects such as bereavement counselling, techniques of emotional regulation coping such as venting, disengagement and optimism, meaning-based coping such as acceptance, self-re-evaluation, the use of religion and spirituality and self-efficacy (Glanz, Rimer, & Viswanath, 2008). Session two focused on interventions that can facilitate the mobilization of social support for the caregivers such as enhancement of supportive family dynamics, seeking of appropriate information and social support including socialization (Chair& Pang, 2008; Raina 2005, Berkman, 1995). Session three focused on interventions which facilitate the optimal functional status for the children with heart diseases and includes counselling for the children to develop skills and be able to construct self-directed solution in respect of the challenging experiences of symptoms of a heart disease (Mitchell, 2011). Additionally, essential aspects of caring for a patient with heart diseases, inter alia the cardiac diet and nutrition, weight management, activity tolerance, palliative care for the child and compliance with the medication schedule were also addressed under this section (Pretorius, Sliwa, Ruf, Walker, & Stewart, 2012). Table 1 displays the components of a home-based health care programme that was implemented.

Table 1 : The components of a home-based health care programme

Sessions	Objectives	Interventions
Session one	Facilitation of emotion focused coping for the caregivers and the children	Bereavement counseling, venting, sengagement, optimism, acceptance, self-re-evaluation, use of religion and self-efficacy.
Session two	Facilitation of mobilization of social support for the caregivers	Supportive family dynamics, seeking of appropriate information & social support, and socialization.
Session 3	Facilitation of optimal functional status for the children	Counseling of the children, cardiac diet and nutrition, management of the child's weight, activity tolerance, palliative care for the child and compliance with the medication schedules

Learning by the caregivers as the primary focus necessitated the application of the principle of adult learning and experiential learning approach. These approachesare presupposed to facilitate self-directed and active learning on the part of the caregivers whereby the latter approach learning as a problem solving tool or the believe that what they are learning is of immediate value, and learning through the medium of concrete experiences, reflective observations, abstract conceptualisation and active experimentation (Knowles (n.d.),Pretorius; 2008, Meyer; 2004; Williams & Walker, 2003;Atherton 2002& Kolb, 1984).

To that end, the participants were given information for knowledge about the disease of the children and the aspects of caring. Demonstrations on practical aspects of caring were given and the

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participants were given feedback on skill performance and where necessary, they were encouraged toimprove.As Cowley (2004) and Stein (1998) propose, the interchange of ideas and attempt at problem solving, inter alia the practice of empathy towards the child and the preparation of food from the locally available food stuffs were encouraged to reinforce learning on the part of the participants.

Finally, and through reflective observation, the participants were given the opportunity to reflect back on their learning experiences consciously and also on how they could apply the insights gained to coping with the demands of providing care for their children at home(Kobus, 2007). Figure 1 below presents the context for the implementation of programme interventions.



Figure 1 : The households and crop field for caregiver(s) of a child with a heart disease in the rural Namibia –the context for the implementation of programme interventions

Indeed the structures of the households and the quality of agricultural subsistence farming are testimonies to the impoverished life of these families. This impoverishment, in turn, means that they cannotcope with providing special care for their children with heart disease.

IV. Phasetwo: Programme Evaluation

The literature advocates for the evaluation of the programme interventions, to assess whether the programme outcomes are congruent with the set programme objectives (Bugge,Helseth and Darbyshire, 2009; Metz (2007; WHO 2002 & Tailor-Powell, Steele, S. & Douglah). Therefore for the purposes of this study, an outcomes evaluation was conducted to determine whether the programme interventionshas empowered caregivers with the knowledge and skills which they need in order to cope with the demands of providing appropriate home care for their children with heart diseases.

The objectives for the programme evaluation were of three folds. Objective one was about evaluating the participants' (caregivers and the children) knowledge of aspects of emotional coping. Objective two was about evaluating the caregivers' knowledge and skills that is required to identify and utilise the social network, while objective three focused on evaluating the children's knowledge about their disease and of self-care.

a) Methods of Programme Outcomes Evaluation

A qualitative outcomes evaluation was conducted. All the participants from the two households where the programme was implemented were asked to participate voluntarily in the outcomes programme evaluation. The data were collected through the interviews, field notes and the testimonials of the participants' experiences of the programme interventions. Taking into account the capabilities and the understanding of the participants, these methods was the most likely to secure the required information from the participants (Parahoo, 2006 &Taylor-Powell et al., 1996).

V. The Findings

The findings of the programme outcomes evaluation indicated that the programme interventions had has a positive impacts on the recipients. As a result, the caregivers reported that they gained knowledge about the child's condition, and they were able to carry out the instrumental tasks of care as verified by the following testimonies.

"I have learnt a lot from the explanation about the child's illness and treatment. I have also learnt about those aspects of care for the child to prevent the child from getting sick, like how to protect the child from cold, not to get sick."

"The child (with heart disease) should eat less or no oil/fat and more of brown bread."

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"Your explanation about the waiting time for treatment also put me at ease."

Additionally, and in accordance the findings from other studies, caregivers reported that the programmes interventions enhanced cohesion within the families of the participants (Thastrum, Munch-Hansen, Wiell, & Romer, 2006). As a result, the caregivers reported positive changes in their ability to make use of the strengths at the family level, as they were then able to share the responsibilities of caring for the child with a heart disease as can be verified from the some of the quotes by one of the participants in this regard.

"We help each other at the family level to allow the focal caregiver to socialise".

Caregivers also reported that they were better of informed about seeking appropriate social support for them to cope with the demands of providing care at home. The interaction with the researcher, with the participants being regarded as individuals with potential and whose views were considered as worthwhile, also added another dimension to the participants' appreciation of the programme interventions.

"Sharing information with a health care provider also encourages one to have faith and wait for the child's treatment with confidence."

Furthermore, and in line with the findings from other studies, caregivers also indicated that, as a result of counselling interventions, the children were also demonstrating the ability to practice self-care management in response to their symptoms (Riegel, Voughan Dickson, Goldberg, & Deatrick,2007). This claim is evidenced in quotes from the caregiver participants.

"By now he knows that if he gets tired, he has to rest. He knows that he does not have to get cold. He always puts on his jersey every morning. He knows he has to wash with warm water. Therefore he puts his water in the sun to warm before bathing."

VI. Discussion

The caregivers indicated that the implementation of the programme had rendered bearable the management of their children with heart diseases at home. The participants demonstrated gain in knowledge base as regard the child's condition, the skills necessary to carry out instrumental tasks of care at home and the knowledge of community-based resources that are necessary for them to cope with providing home care for their children with heart diseases.

Through the discussions, interchange of ideas andconcrete experiences the participants learnt new knowledge and values.Attempts at problem solving andactive experimentation with instrumental tasks such as practicing empathy towards the child concerned, preparation of the child's diet from the locally available food stuffs and the measuring out of medications allowed the participants to practically clarify and personalise concrete learning and, whichall culminated in the increased retention of knowledge and skills necessary to provide home care for the child concerned (Cowley, 2004; Kirby, 2000; Stein, 1998).Thereby caregivers displayed knowledge, understanding and self-efficacy as essential qualities which are required of a competent caregiver who can provide safe home care for a child with a heart disease (Ågren 2010; George, 2008; Glanz et al., 2008, Aljandro, Huberto & Augustin 2008; Sniehotta, Scholtz & Schiwarzer 2005).

Equally important,is that the programme interventions had enabled the family members to adopt a new perception of the children's condition and the demands of care. Following the programme interventions, the caregivers were able to move out of limbo of emotional- and care vulnerability, and were able to construct self-directed solution to mediate the effects of negative appraisals of the caring role. They were able to reorganise roles and set priorities to manage the demands of caring for the child at home, therefore demonstrating willingness and a sense of responsibility for provision of home care for the children concerned as their dependents (George, 2008; Stadjuhar, Legh Martin, Barwich & Fyles 2008). Therefore, if the programme interventions were to beextended to more of families from a similar context, their situation may also improve. The challenge now involves ensuring the sustainability of this programme.Figure 2 below displays the outcomes for the programme evaluation.

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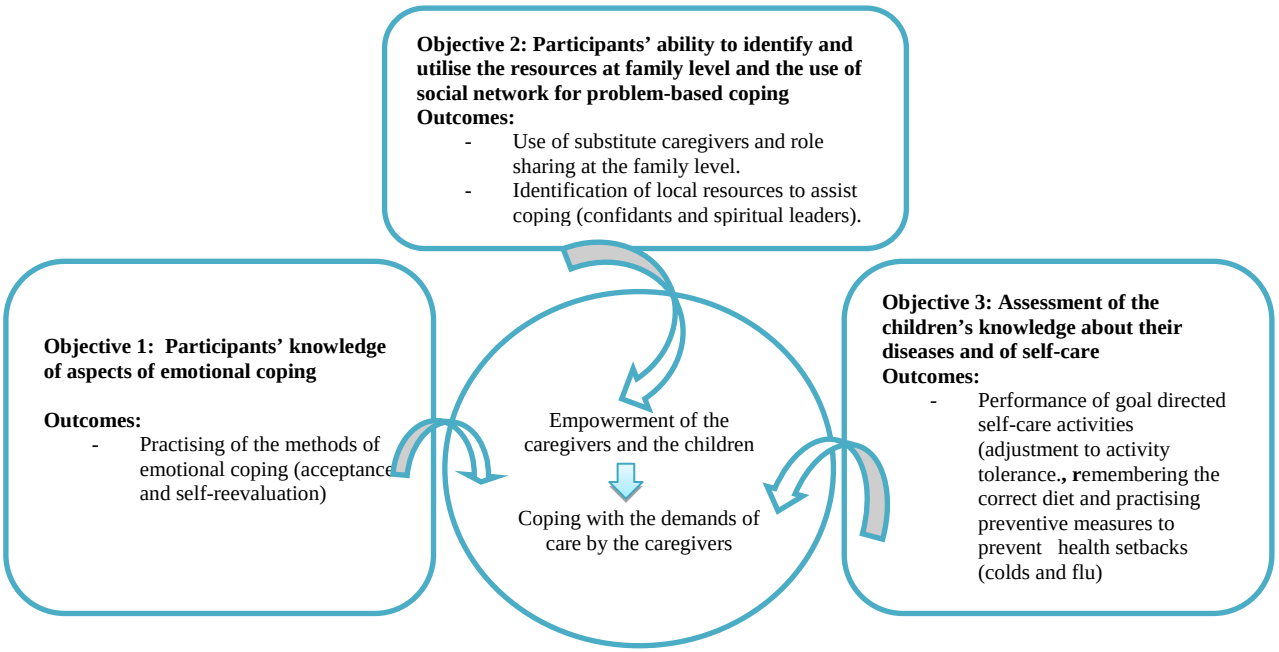


Figure 2 : Outcomes of the programme evaluation

Indeed as Beck and Wiencek-Kurek (2007) states that in instead of passing judgement on people because of their socio-economic situation, it is rather important to acknowledge that caregivers of children with heart diseases from the rural areas in Namibia are individuals with potentials, trying to cope with a difficulty situation and they therefore need to be assisted for them to do the best they can do.

VII. Conclusions

The outcomes evaluation indicated the trust of the participants in the programme interventions. The caregivers regarded the programme as having been worth the effort and indicated that the multi-component interventions facilitated a positive caring environment with the next of kin and social support as invaluable resources for the provision of on-going care at home. If sustained, the programme is therefore likely to make a difference to their coping with the demands of caregiving at home. Hence the recommendation for mainstreaming of the programme interventions in the health care programme at the district level of health care delivery, for a sustainable support to these caregivers and their children concerned.

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Abbreviations supposed to be used carefully. The abbreviated name or expression is supposed to be cited in full at first usage, followed by the conventional abbreviation in parentheses.

Metric SI units are supposed to generally be used excluding where they conflict with current practice or are confusing. For illustration, 1.4 l rather than 1.4 × 10-3 m3, or 4 mm somewhat than 4 × 10-3 m. Chemical formula and solutions must identify the form used, e.g. anhydrous or hydrated, and the concentration must be in clearly defined units. Common species names should be followed by underlines at the first mention. For following use the generic name should be constricted to a single letter, if it is clear.

Structure

All manuscripts submitted to Global Journals Inc. (US), ought to include:

Title: The title page must carry an instructive title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) wherever the work was carried out. The full postal address in addition with the e-mail address of related author must be given. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining and indexing.

Abstract, used in Original Papers and Reviews:

Optimizing Abstract for Search Engines

Many researchers searching for information online will use search engines such as Google, Yahoo or similar. By optimizing your paper for search engines, you will amplify the chance of someone finding it. This in turn will make it more likely to be viewed and/or cited in a further work. Global Journals Inc. (US) have compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Key Words

A major linchpin in research work for the writing research paper is the keyword search, which one will employ to find both library and Internet resources.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy and planning a list of possible keywords and phrases to try.

Search engines for most searches, use Boolean searching, which is somewhat different from Internet searches. The Boolean search uses "operators," words (and, or, not, and near) that enable you to expand or narrow your affords. Tips for research paper while preparing research paper are very helpful guideline of research paper.

Choice of key words is first tool of tips to write research paper. Research paper writing is an art.A few tips for deciding as strategically as possible about keyword search:

- One should start brainstorming lists of possible keywords before even begin searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in research paper?" Then consider synonyms for the important words.
- It may take the discovery of only one relevant paper to let steer in the right keyword direction because in most databases, the keywords under which a research paper is abstracted are listed with the paper.
- One should avoid outdated words.

Keywords are the key that opens a door to research work sources. Keyword searching is an art in which researcher's skills are bound to improve with experience and time.

Numerical Methods: Numerical methods used should be clear and, where appropriate, supported by references.

Acknowledgements: Please make these as concise as possible.

References

References follow the Harvard scheme of referencing. References in the text should cite the authors' names followed by the time of their publication, unless there are three or more authors when simply the first author's name is quoted followed by et al. unpublished work has to only be cited where necessary, and only in the text. Copies of references in press in other journals have to be supplied with submitted typescripts. It is necessary that all citations and references be carefully checked before submission, as mistakes or omissions will cause delays.

References to information on the World Wide Web can be given, but only if the information is available without charge to readers on an official site. Wikipedia and Similar websites are not allowed where anyone can change the information. Authors will be asked to make available electronic copies of the cited information for inclusion on the Global Journals Inc. (US) homepage at the judgment of the Editorial Board.

The Editorial Board and Global Journals Inc. (US) recommend that, citation of online-published papers and other material should be done via a DOI (digital object identifier). If an author cites anything, which does not have a DOI, they run the risk of the cited material not being noticeable.

The Editorial Board and Global Journals Inc. (US) recommend the use of a tool such as Reference Manager for reference management and formatting.

Tables, Figures and Figure Legends

Tables: Tables should be few in number, cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g. Table 4, a self-explanatory caption and be on a separate sheet. Vertical lines should not be used.

Figures: Figures are supposed to be submitted as separate files. Always take in a citation in the text for each figure using Arabic numbers, e.g. Fig. 4. Artwork must be submitted online in electronic form by e-mailing them.

Preparation of Electronic Figures for Publication

Even though low quality images are sufficient for review purposes, print publication requires high quality images to prevent the final product being blurred or fuzzy. Submit (or e-mail) EPS (line art) or TIFF (halftone/photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Do not use pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings) in relation to the imitation size. Please give the data for figures in black and white or submit a Color Work Agreement Form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution (at final image size) ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs) : >350 dpi; figures containing both halftone and line images: >650 dpi.

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6. AFTER ACCEPTANCE

Upon approval of a paper for publication, the manuscript will be forwarded to the dean, who is responsible for the publication of the Global Journals Inc. (US).

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(Free of charge) from the following website:

www.adobe.com/products/acrobat/readstep2.html. This will facilitate the file to be opened, read on screen, and printed out in order for any corrections to be added. Further instructions will be sent with the proof.

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Before start writing a good quality Computer Science Research Paper, let us first understand what is Computer Science Research Paper? So, Computer Science Research Paper is the paper which is written by professionals or scientists who are associated to Computer Science and Information Technology, or doing research study in these areas. If you are novel to this field then you can consult about this field from your supervisor or guide.

TECHNIQUES FOR WRITING A GOOD QUALITY RESEARCH PAPER:

1. Choosing the topic: In most cases, the topic is searched by the interest of author but it can be also suggested by the guides. You can have several topics and then you can judge that in which topic or subject you are finding yourself most comfortable. This can be done by asking several questions to yourself, like Will I be able to carry our search in this area? Will I find all necessary recourses to accomplish the search? Will I be able to find all information in this field area? If the answer of these types of questions will be "Yes" then you can choose that topic. In most of the cases, you may have to conduct the surveys and have to visit several places because this field is related to Computer Science and Information Technology. Also, you may have to do a lot of work to find all rise and falls regarding the various data of that subject. Sometimes, detailed information plays a vital role, instead of short information.

2. Evaluators are human: First thing to remember that evaluators are also human being. They are not only meant for rejecting a paper. They are here to evaluate your paper. So, present your Best.

3. Think Like Evaluators: If you are in a confusion or getting demotivated that your paper will be accepted by evaluators or not, then think and try to evaluate your paper like an Evaluator. Try to understand that what an evaluator wants in your research paper and automatically you will have your answer.

4. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

5. Ask your Guides: If you are having any difficulty in your research, then do not hesitate to share your difficulty to your guide (if you have any). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work then ask the supervisor to help you with the alternative. He might also provide you the list of essential readings.

6. Use of computer is recommended: As you are doing research in the field of Computer Science, then this point is quite obvious.

7. Use right software: Always use good quality software packages. If you are not capable to judge good software then you can lose quality of your paper unknowingly. There are various software programs available to help you, which you can get through Internet.

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9. Use and get big pictures: Always use encyclopedias, Wikipedia to get pictures so that you can go into the depth.

10. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right! It is a good habit, which helps to not to lose your continuity. You should always use bookmarks while searching on Internet also, which will make your search easier.

11. Revise what you wrote: When you write anything, always read it, summarize it and then finalize it.

12. Make all efforts: Make all efforts to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in introduction, that what is the need of a particular research paper. Polish your work by good skill of writing and always give an evaluator, what he wants.

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16. Use proper verb tense: Use proper verb tenses in your paper. Use past tense, to present those events that happened. Use present tense to indicate events that are going on. Use future tense to indicate future happening events. Use of improper and wrong tenses will confuse the evaluator. Avoid the sentences that are incomplete.

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18. Pick a good study spot: To do your research studies always try to pick a spot, which is quiet. Every spot is not for studies. Spot that suits you choose it and proceed further.

19. Know what you know: Always try to know, what you know by making objectives. Else, you will be confused and cannot achieve your target.

20. Use good quality grammar: Always use a good quality grammar and use words that will throw positive impact on evaluator. Use of good quality grammar does not mean to use tough words, that for each word the evaluator has to go through dictionary. Do not start sentence with a conjunction. Do not fragment sentences. Eliminate one-word sentences. Ignore passive voice. Do not ever use a big word when a diminutive one would suffice. Verbs have to be in agreement with their subjects. Prepositions are not expressions to finish sentences with. It is incorrect to ever divide an infinitive. Avoid clichés like the disease. Also, always shun irritating alliteration. Use language that is simple and straight forward. put together a neat summary.

21. Arrangement of information: Each section of the main body should start with an opening sentence and there should be a changeover at the end of the section. Give only valid and powerful arguments to your topic. You may also maintain your arguments with records.

22. Never start in last minute: Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

23. Multitasking in research is not good: Doing several things at the same time proves bad habit in case of research activity. Research is an area, where everything has a particular time slot. Divide your research work in parts and do particular part in particular time slot.

24. Never copy others' work: Never copy others' work and give it your name because if evaluator has seen it anywhere you will be in trouble.

25. Take proper rest and food: No matter how many hours you spend for your research activity, if you are not taking care of your health then all your efforts will be in vain. For a quality research, study is must, and this can be done by taking proper rest and food.

26. Go for seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.



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27. Refresh your mind after intervals: Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

28. Make colleagues: Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

29. Think technically: Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

30. Think and then print: When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

31. Adding unnecessary information: Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

32. Never oversimplify everything: To add material in your research paper, never go for oversimplification. This will definitely irritate the evaluator. Be more or less specific. Also too, by no means, ever use rhythmic redundancies. Contractions aren't essential and shouldn't be there used. Comparisons are as terrible as clichés. Give up ampersands and abbreviations, and so on. Remove commas, that are, not necessary. Parenthetical words however should be together with this in commas. Understatement is all the time the complete best way to put onward earth-shaking thoughts. Give a detailed literary review.

33. Report concluded results: Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

34. After conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

Final Points:

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

Writing a research paper is not an easy job no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record keeping are the only means to make straightforward the progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear

· Adhere to recommended page limits

Mistakes to evade

- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

In every sections of your document

· Use standard writing style including articles ("a", "the," etc.)

· Keep on paying attention on the research topic of the paper

· Use paragraphs to split each significant point (excluding for the abstract)

· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

· Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives

· Shun use of extra pictures - include only those figures essential to presenting results

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Choose a revealing title. It should be short. It should not have non-standard acronyms or abbreviations. It should not exceed two printed lines. It should include the name(s) and address (es) of all authors.



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Abstract:

The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript--must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing references at this point.

An abstract is a brief distinct paragraph summary of finished work or work in development. In a minute or less a reviewer can be taught the foundation behind the study, common approach to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Yet, use comprehensive sentences and do not let go readability for briefness. You can maintain it succinct by phrasing sentences so that they provide more than lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study, with the subsequent elements in any summary. Try to maintain the initial two items to no more than one ruling each.

- Reason of the study - theory, overall issue, purpose
- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
- As a outline of job done, it is always written in past tense
- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
- Center on shortening results - bound background information to a verdict or two, if completely necessary
- What you account in an conceptual must be regular with what you reported in the manuscript
- Exact spelling, clearness of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else

Introduction:

The **Introduction** should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
- Sort out your thoughts; manufacture one key point with every section. If you make the four points listed above, you will need a least of four paragraphs.

- Present surroundings information only as desirable in order hold up a situation. The reviewer does not desire to read the whole thing you know about a topic.
- Shape the theory/purpose specifically - do not take a broad view.
- As always, give awareness to spelling, simplicity and correctness of sentences and phrases.

Procedures (Methods and Materials):

This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt for the least amount of information that would permit another capable scientist to spare your outcome but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section. When a technique is used that has been well described in another object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text all particular resources and broad procedures, so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step by step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

What to keep away from

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.



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Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
- If you desire, you may place your figures and tables properly within the text of your results part.

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- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

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The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a argument should be. Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly described. Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved with prospect, and let it drop at that.

- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

- When you refer to information, differentiate data generated by your own studies from available information
- Submit to work done by specific persons (including you) in past tense.
- Submit to generally acknowledged facts and main beliefs in present tense.

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	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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