Information Flows for African Communities and Their Environments:

An Analysis of Roles of Geographical Information in Processes of Decision Making

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In chess, no concept had once been more firmly established than control of the center, and for much the same reason as boxing — it gave mobility for attack to the left or the right. Later, a revolution came to chess, and new masters argued that if one occupied the center too early, weaknesses were created as well as strengths. It was better to invade the center after the opponent was committed. Of course with such a strategy you had to be resourceful in a cramped space. Tactical brilliance was essential at every step.

The Fight
pp220 - 221
Norman Mailer, 1991, Penguin Books, London

Abstract

The identification of roles that geographical information can play in environmental decision making of, and for, African communities is the objective of this thesis. The hypothesis of this paper is as follows. Geographical information of Africa functions to reproduce and sustain environmental and socio-economic problems in the continent while maintaining various interests of research and decision making communities although such information are supposed to be used for the solution of those problems. The study also contends that emerging communication networks being most prominently actualised as the Internet have a potential to enable local communities to change the use / abuse of information about themselves and their environments.

The analysis of current information flows via the concept of 'power' of Michael Foucault and according to the concept of 'simulation' of Jean Baudrillard suggests the need for examination of conventional information flows as alternatives to the status quo of decision making proces.

Flows of scientific information are self-perpetuating. They go through research communities collecting information from fields and decision making communities. Scientific suggestions are converted into agendas and actions. Imposed decisions resulting from these flows affect local communities and their environments. Research communities study such effects, and information flows repeat the process again and again. Although individuals of the three types of communities - scientists, decision makers and local communities - may want "improvements" of some sort, institutions do not need any radical change. They only need a continuation of the self-perpetuation of the information flows for their survival. This phenomenon is termed the 'dynamic immobility' of the Foucauldian structure.

A second feature of the information flows critically examined concerns the manipulation of the information by those 'producing' it. It is argued that the flows of geographical information on Africa delivered to the public by the mass media as news and reports contributes to the 'critical mass for implosion of meaning'. In such circumstances, the significance of African events such as famines and droughts themselves disappear, and only the illusion of a simplified and allegorised combination of tragedies and of humanitarian efforts are produced and circulated. The mass media do not simply provide information collected from the field to the public but rather produce material to entertain and please the public by utilising various proper nouns such as placenames picked up from the fields in Africa. Just as scientific hypotheses are academic consumables for decision making communities in the Foucauldian sense, news and reports are humanitarian consumables for the public in the Baudrillardian sense.

Individuals in African communities and those concerned with these communities need alternative information flows to verify and modify conventional decision making processes. Geographical information, not as an institutional tool for self-perpetuating production of policies and actions but as a process in which one individual informs his / her circumstance to another, can become an effective method to break out the status quo. The possibility of developing alternative information flows is considered using the case of Zapatista action in Mexico as a reference. Findings from the analysis of the Zapatista case form a foundation for the development of methods of generating alternative information flows. The discussion of such methods includes an investigation of telematics in Africa. Infrastructures for telecommunication with special reference to Internet connectivity of African countries and approaches to create geo-informatic products as interfaces for different perceptions held by the diverse communities in and around Africa need to be examined in this context. Many African countries are, in fact, deeply involved in attempts to enhance Internet connectivity. It is also possible for individuals to process geographical data, the availability of which through the Internet is rapidly expanding, to check critically information circulating in the conventional decision making processes.

Acknowledgements

At the beginning of this research, I secretly hoped to write a detective story having the style of academic thesis. This idea was inspired by Amartya Sen's *Famines and Poverty* (1981). It is a book on social science but its details, many of its paragraphs, are as excitingly investigative as a good detective story. I started collecting materials from libraries as well as from other resources, and decided who, or what, was the "murderer" in my "whodunit" world. This phase of the research was indeed an adventurous detective story. Observing famine victims, detecting development crimes and chasing the informatic "murderer" were fascinating things to do. The adventure was, however, replaced by a severe difficulty at the early stage of the writing. While revelation of the "murderer" at the outset is rarely a good idea in writing of a detective story, an academic thesis is expected to express clearly background, possibilities (i.e. suspects), and the "real" cause (i.e. the murderer) at the beginning. An academic thesis is often like a public prosecutor's protocol, which is not necessarily compatible with an ideal plot for a detective story. If the "murderer" is revealed to readers at the first page of a mystery, the writer needs to rely solely on his / her writing techniques but not on the reader's desire to know "who has done it". It would be a very hard task for any mystery writer. In fact, this explains why the essence of many academic theses is in their first chapters and their remaining chapters tend to consist merely of supportive evidence. This realisation changed my innocent intention, writing a detective story having the style of academic thesis, to a challenge to the default plot of academic writing. Now, I decided to write a thriller. I accepted revelation of the "murderer" in the first chapter to an extent. After the discussions in the second and third chapters, the "murderer" is fully disclosed in the fourth chapter. I, however, quietly made the "murderer" as formidable as possible in these chapters. The "murderer" appears but cannot be caught in the fourth chapter. The remaining fifth and sixth chapters, then, consist of consideration of tactics to fight against the "murderer" and to prevent future "murders".

Not surprisingly, the process of writing became a tug of war between my supervisor and my secret intention. An academic supervisor demands clarity, whereas a mystery writer consciously or sub-consciously tries to keep readers in suspense. My supervisor, Professor Tony Allan, was an ideal opponent in this context. On the basis of his decades of experience in research supervision, he demanded clarity of argument and relevant evidence to the full extent. His demands kept me in suspense throughout the writing. It has to be, however, also noted that despite his inclination to academic clarity he tolerated the oddity of my approach. I deeply thank him for the hard demand as well as academic inspiration. He is the greatest reader of this study, and the arm wrestling with the very English professor was one of the most precious experiences that the overseas student from a small island on the other side of the Eurasian continent has ever had.

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Contents

Abstract			ii
Acknowledgements			iii
Contents			iv
List of Figures			vi
List of Tables			vii
Glossary of terms			viii
Chapter	1.	**Introduction: Conceptual point of departure**	
	1.1	Epimenidean Paradox	001
	1.2	Foucauldian 'power' in "famine", "drought" and "development"	003
	1.3	Baudrillardian simulation and Foucaultian 'power'	013
	1.4	Conceptual point of departure	022
Chapter	2.	**Foucauldian approach to "famine", "drought" and "desertification"**	
	2.1	Introduction	030
	2.2	Evolution of famine discourse	032
	2.3	Definitions of drought and perceptions of communities	036
	2.4	Data in African case studies of famine by Sen	043
	2.5	Interests of communities and prospects of interdisciplinarity	054
	2.6	"Desertification" and its function	062
Chapter	3.	**Propaganda and its Baudrillardian Destination**	
	3.1	Introduction	070
	3.2	Propaganda at work	074
	3.3	Baudrillardian stalemate	096
Chapter	4.	**Foucauldian and Baudrillardian Mechanisms**	
	4.1	Introduction	103
	4.2	Compositions of communities and academic disciplines	104
	4.3	Communities and Foucauldian mechanism	112
	4.4	Manoeuvres of images in Baudrillardian mechanism	121
	4.5	Possibility of breakthrough	129
Chapter 5.		**Autonomous Commnication Networks for Africa**	
	5.1	Introduction	136
	5.2	The Zapatista	139
	5.3	Autonomous Communication Networks	158

	5.4	Information technology and informatics of Africa	168
Chapter	**6.**	**Geo-informatic Products for Autonomous Communication Networks**	
	6.1	Introduction	190
	6.2	Synoptic contexts and definite contexts for information	191
	6.3	Modelling and labelling	201
	6.4	Handling of data	215
Chapter	**7.**	**Conclusion**	238
Bibliography			246

List of Figures

1.2.1	First set of domains	006
1.2.2	Second set of domains	007
1.3.1	Third set of domains	017
2.6.1	Four quadrants of desertification research	063
4.2.1	Position of communities	105
4.2.2	Spectrum of academic disciplines	106
4.2.3	Examples of interactions among actors represented as paths	107
4.2.4	Hypothetical disaster story	110
4.3.1	Flows of information among the communities and environments	113
4.3.2	Foucauldian mechanism	116
4.4.1	Foucauldian mechanism and public perception	121
4.4.2	Effect of "Media Tornadoes"	123
4.4.3	Foucauldian and Baudrillardian planes	123
4.4.4	Baudrillardian 'ste of total uncertainty'	126
6.2.1	Information in synoptic and definite contexts	193
6.3.1	Classification schemes for West African land cover	205
6.4.1	Shaded relief map of Africa	220
6.4.2	3D scene of the Nile Basin	223
6.4.3	Some framaes from 3D Nile Basin Movie	223
6.4.4	Sequential images of Africa showing phenology	229
6.4.5	Graphical Explanation of FCCs Shown on figure 6.4.4	231

List of Tables

2.2.1	Typology of Early Warning Systems	032
2.4.1	Sources of data used in 'Famines and Poverty'	043
2.4.2	Technical & political problems in national data of African countries	046
2.4.3	Variables used by Sen in the chapter 7 & 8 of 'Famines and Poverty'	047
3.2.1	Comparison between news of Africa and reports of the Persian Gulf War	093
4.2.1	Hypothetical Disaster Story	109
5.4.1	44 countries and territories which have full INternet access	169
5.4.2	81 development agencies carrying out projects to support 'Information Communication Technologies (ICTs)'	171
5.4.3	Annotations of some of agencies on the table 5.4.2	172
5.4.4	Telecommunication development in Ethiopia: Late 1980s to late 1990s	177
5.4.5	Telecommunication development in Nigeria: Late 1980s to late 1990s	178
5.4.6	Telecommunication development in Tanzania: Late 1980s to late 1990s	180
6.3.1	Africa Seasonal Land Cover Regions Legend	207
6.3.2	IGBP Global Land Cover Legend	208

Glossary of terms

Chiapas
The Southeast region in Mexico

discourse
hypothesis that mimicks truth.

ETA
Ethiopian Telecommunication Authority

EWS
Early Warning System

FAO
Food and Agriculture Organization of the United States

Foucauldian power
power as networks of consensus

GATT
General Agreement on Tariffs and Trade

geo-informatics
synonym of geomatics

geomatics
The field of study that integrates the acquisition, processing, analysis, display and management of spatial information. It includes, but is not limited to, the new and traditional disciplines of photogrammetry and remote sensing, land and engineering surveying, geographic information systems, cartography, geodesy, hydrography, cadastral surveying, land information management and mining surveying. It is a grouping of subjects in the spatial and environmental information sciences.
(c.f. http://www.ge.ucl.ac.uk/main.html#DEFINE)

GIEWS
Global Information and Early Warning System

holon system
The system that consists of holon. Holons are organised to form a hierarchy. A higher holon includes all the lower holons — e.g. A finger as a holon include its nail, bones, muscle tissues and so on as its lower holons. The term holon was invented by Arthr Koestler.

hyper-reality
'*T[t]hat which is always already reproduced*', while the *real* is defined as '*that of which it is possible to*

give an equivalent reproduction' (Baudrillard, 1983). The social state where only reproductions of matters ranging from a discource to a piece of art take place, but not emergence of anything not having been reproduced ever.

ICT
Internet Commuication Technologies

informatics
The consequences of information technology, including the variety of ways in which information flows, is processed, is utilized, affects productivity and efficiency, is used for monitoring and control purposes, and lastly, influences socio-economic development and society itself. (Foster, 1994)

JRC
Joint Research Centre. A reseach institute of EU.

meta-context
Parental context. The discourse from which the context of current interest originates.

meta-worldview
Parental worldview. The discourse from which the worldview that one holds originates.

NAFTA
North American Free Trade Agreement

NITEL
Nigeria Telecommunications Ltd.

NNPC
Nigerian National Petroleum Corporation

ODA
Official Development Assistance

Oxfam
The British non-governmental relief organisation based in Oxford

Baudrillardian simulation
The process that transform reality into hyper-reality (See hyper-reality)

telematics
The set of technologies and services using both information technology and telecommunications for collecting, storing, processing and communicating information (Virilio, 1997)

TPTC
Tanzanian Post and Telecommunications Corporation

TRP
Tanzanian Telecommunications Restructuring Programme

UNDP
United Nations Development Programme

UNDRO
United Nations Disaster Relief Office

UNEP
United Nation Environment Planning

UNIDO
United Nations Industrial Development Organization

UNU
United Nations Universty

USGS
U.S. Geological Survey

Virtuality
synonym of hyper-reality

Chapter 1: Introduction:

Conceptual point of departure

1.1 Epimenidean Paradox

This study is about geographical information concerned with Africa. Considerations of this issue in this particular study are confined neither to the technical features of GIS and earth observation nor to the social scientific contexts. Technical contexts and social scientific contexts are inter-woven in the development and application of geographical information to African problems. The complex fabric to which this study relates requires a holistic approach. The first chapter provides the conceptual point of departure by examining material produced by academic communities. It cites not just social and natural scientific literature but philosophical ideas. There are two reasons for this multi-faceted approach: 1) as the study is about information, epistemology, the philosophical discipline concerned with enquiry into the nature, sources and validity of knowledge (Grayling, 1996, p 38), is essential; and 2) introduction of epistemological considerations put different contexts, worldviews, into meta-contexts, meta-worldviews. If this chapter only deals with material from a particular scientific field, the study will be lost in the maze of entangling specific contexts. Epistemology, combined with its counterpart, scepticism, does not help us navigate the deep forest of information, but they can be a candle light by which to seek a path. They enable perspectives on the complex interwoven contexts, which will become the conceptual point of departure for this study.

One of the most fundamental characteristics of information, which is often neglected, is that it is relative, not absolute. Information never spontaneously emerges from 'reality'. It comes into existence only when it is "acquired" from 'reality' by an individual or an organisation. The origin of the word, information, clearly

indicates this mechanism. According to an etymological dictionary (Klein, 1966), the word consists of:

inform ...'to give form to, to shape'

in —, 'in', and formare, 'to form, shape'... (p793); and, a suffix,

- ation ...denoting action, process, state or condition (p122).

An epistemological question can be raised from the above; what does determine the form ascribed to formless 'reality'? Not just the way it is acquired but the way it is processed and interpreted are determined by the actor's worldview. Then, what does form the actor's worldview? It is formed by information that the actor has previously acquired, processed, and interpreted. In this sense, a piece of information creates another piece of information. Consequently, any piece of information is neither neutral nor absolute, but is relative to the context, the actor's worldview, in which it is placed. The relativity of information develops into a complex issue as every context frequently entangles with another. Moreover, it evolves to a kind of Epimenidean paradox, a paradox which was named after the Cretan philosopher Epimenides who claimed that all Cretans were liars, through three steps:

1) a worldview becomes "subjectively absolute" to its possessor;

2) One acquires the notion of relativity of information by "objectively" analyzing such "subjectively absolute worldviews"; then

3) the "objectively" derived notion of relativity becomes yet another "subjectively absolute worldview".

These steps form a loop, and its outcome is circular logic. If it is possible to escape from an Epimenidean loop, the first stage must be the recognition of existence of the circularity. This research demands multiple viewpoints to look at such interwoven contexts and self-referential paradoxes of geographical information of Africa.

1.2 Foucauldian power in "famine", "drought" and "development"

Imagine research which focuses upon geographical information and a region in Africa, the Sahel, for example. The researcher completes the research and writes a report in a few months or years. What the report tells might be ground-breaking or conventional. In either case, it will be read by a number of people. The number of the readers could be a few, tens, hundreds or thousands, but most of them would fall in one of three categories: 1) people who read the report for "pure" academic and intellectual reasons; 2) people with "practical" purposes such as making decisions to assist famine victims, to ameliorate impacts of drought on agriculture, or to develop rural communities; and; 3) people with both the first and second reasons. The report is essentially material to study and to evaluate for a person in the first category, material to consult for a person in the second category, and mixture of those two for a person in the third category. What the report tells would cause different responses in the different people, but one thing is certain: even if it is fully agreed by a large number of people, not any individual in any of the three categories would accept what the report tells as the absolute truth. Even if the report has the highest possible quality, any reader would think that its acceptance is still subject to further refinement, actualisation and adjustment. Any report is not an equivalent of Koran, the New or Old Testament, or a sutra. This may be taken for granted at the conscious level in individual reader's mind. A rather contradictory phenomenon, however, could occur at the other end of a complex information flow. The report and similar attempts may form a cluster which starts 'pretending' to be the absolute truth at the level of practice in the study area despite of the fact that it is not. A decision merely denotes that it is the best decision. Otherwise it cannot be a decision. Food may be given to people who are supposed to be in famine, wells may be dug at points where the report and its coequals seem to suggest, and measures may be taken to "improve"' quality of local people's environments, as the best solutions. Decisions mimic the 'absolute truth'. At this stage, 'reality' is at least one step ahead of what the writer of the report would imagine. The hypotheses denoted in the report may connote the 'tune' of the absolute truth. The process is autonomous from the will of any individual. It incorporates a range of 'wills'.

Let us contemplate the idea that distinction between a hypothesis and the "exact explanation" is often blurred. The very nature of information, relative to its context, implies that any reasoning, definition, interpretation or explanation is essentially hypothetical. It can be accepted, however, or consumed, as the absolute truth. What Baudrillard (1994, p54) writes about news in the Roumanian revolution has a relevance here.

> News [*information*] makes everything credible (that is, uncertain), even previous facts, even future events. The criteria of truth have been supplanted by the principle of credibility (which is also the principle of statistics and opinion polls), and this is the true guiding principle of news. The uncertainty I am speaking of is like a virus which affects or infects all history, current events and images. Even if it is refuted, it can be refuted virtually, since virtuality forms part of reality itself — a reality which is now uncertain, paradoxical, random, hyper-real, filtered by the medium, cut adrift by its own image.

Virtuality is only a part of reality but not the whole of reality, which has tremendous importance in consideration of function of geographical information of Africa. A hypothesis composes virtuality, while the "exact explanation" is about the whole of 'reality'. Confusion comes into existence when those distinctions are neglected as 'the criteria of truth have been supplanted by the principle of credibility (ibid.)'. A comment made by De Waal (1986, p1) in his study for the Sudanese famine echoes to this point.

> Definitions may appear to be a purely academic issue when we are confronted with an event as huge and ugly as a famine. The normal role of a definition is so that it can be used to identify an instance of a particular phenomenon. Definitions of famine on the whole do not do that; rather they describe situations that have already been defined as famines.

Chapter 1 - Section 2

Any definition of "famine" is essentially hypothetical. A hypothesis could compose the domain of virtuality through academic credibility, but "famine" physically transcends such a domain. Then, what does it imply? It makes thoughts conscious of position of viewpoints for phenomena in Africa: a viewpoint is either inside or outside of virtuality.

An crucial question arises at this point. What does differentiate virtuality from the rest of the reality? Eco's critique (1979, p249) on Barthe's inaugural lecture delivered at the Collège de France in 1977 seems to offer a clue to answer to this question.

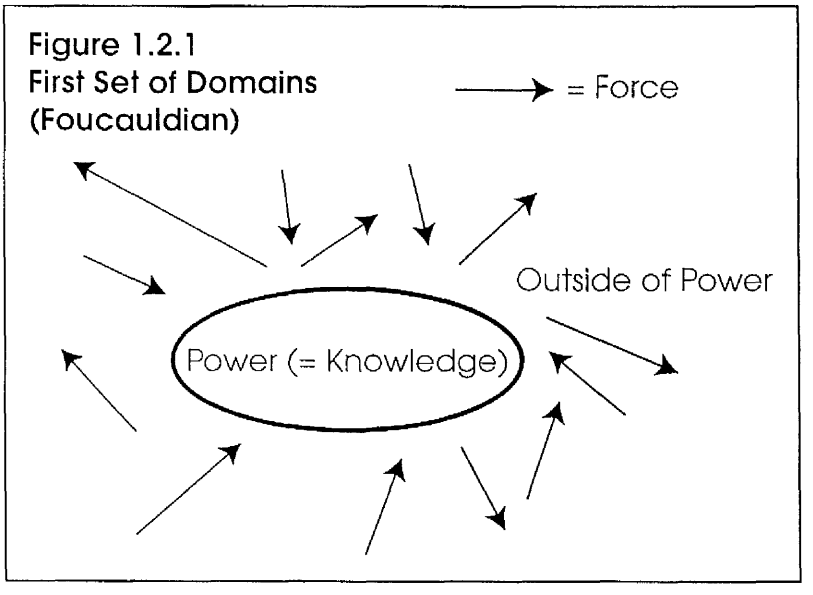
> A force is applied to another force: They form a parallelogram of forces. They do not cancel one another: they are composed, according to a law. The play among forces is reformist: It produces compromises. But the game is never between two forces; the parallelogram gives rise to far more complex multidimensional figures. To decide which forces must be set against which other forces, decisions are made which are dependent not on the play of forces but on the play of power. A knowledge is produced, of the composition of forces.

The author regards 'power' as 'network of consensus' which is, as Barthe and his patron at the Collège, Foucault, argue, 'exercised rather than possessed'. It is worth looking at the vivid description of 'power' made by Foucault (1976, p98) himself.

> .....power is not to be taken to be a phenomenon of one individual's consolidated and homogenous domination over others, or that of one group or class over others. What, by contrast, should always be kept in mind is that power, if we do not take too distant a view

> of it, is not that which makes the difference between those who exclusively possess and retain it, and those who do not have it and submit to it. Power must be analysed as something which circulates, or rather as something which only functions in the form of a chain. It is never localized here or there, never in anybody's hands, never appropriated as a commodity or piece of wealth. Power is employed and exercised through a net-like organization. And not only do individuals circulate between its threads; they are always in the position of simultaneously undergoing and exercising this power. They are not only its inert or connecting target; they are always also the elements of its articulation. In other words, individuals are the vehicles of power, not its points of application.

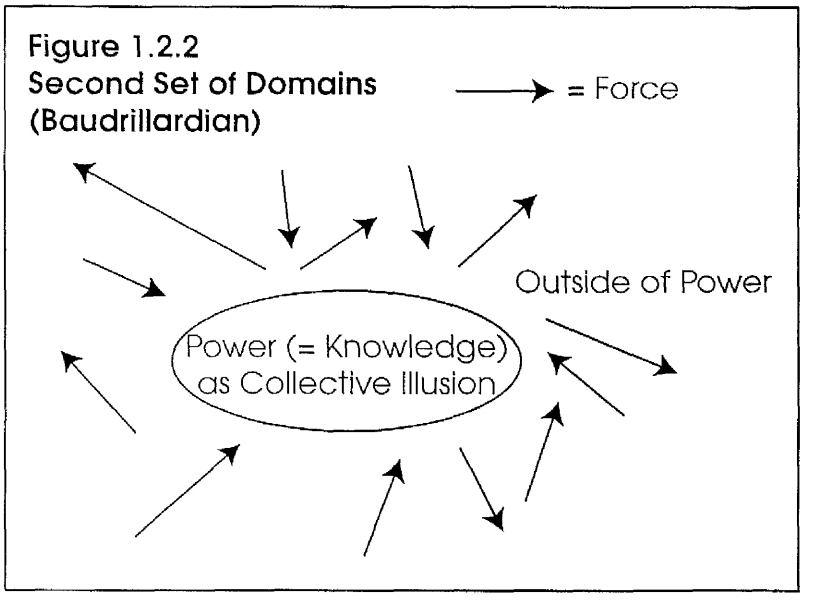
On the other hand, force is both possessed and exercised by Nature, individuals, or groups. 'Power' comes into existence as 'knowledge' is produced by the process in which the 'parallelogram of forces' (Eco, 1979)



develops into 'complex multidimensional figures' (ibid.). In this very specific context, 'knowledge' is 'power''. 'Knowledge', then, constitutes *discourse* which autonomously evolves beyond any individual's will and subjects individuals to its autonomy. The difference between force and this Foucauldian notion of 'power' becomes clear as:

Oppositions to force always obtain an immediate reply, like the clash of two billiard balls; those against power always obtain indirect replies.

(Eco, 1979, p 252)



It may seem that virtuality is the domain where 'power', 'network of consensus', prevails, and the domain outside of virtuality is where forces clash. One has to be careful at this point, however. In his critique on Foucault, Baudrillard (1987, p60) himself writes:

When one talks so much about power, it's because it can no longer be found anywhere.

This extreme insight implies the possibility that power is a collective illusion in the today's world. This could have tremendous importance for this study, but we are not yet at the stage to accept or reject it. Two sets of domains have to be considered as shown above: the first set consists of the domains of 'power' as 'network of consensus', and outside of 'power' (figure 1.2.1); and, the second set consists of the domains of virtuality where 'power' is a collective illusion, and outside of the 'virtuality' (figure 1.2.2). An advantage of this approach is

that the second set can be used for testing concepts involving the 'Foucauldian' notion of power. Considerations relating to the first set shall be made at first, then the second set shall be deployed to critically examine them.

Let us come back to the study by De Waal (1989). With the awareness for the difference between "inside" and "outside", his comments on the relationship between power and definition of famine can be put into a lucid context in the first set of domains.

> Who defines an event as 'famine' is a question of power relations within and between societies.
>
> The event is defined by foreigners, who create a perceived moral imperative for external intervention. The famine victims live (or die) under an alien definition. Another strand of this is the 'famine industry' of the specialised agencies, who see famine in terms of technical issues such as 'early-warning systems', 'food security', logistics, and 'nutritional surveillance'. A closer analysis of just one example will show how an apparently beneficent (or at least innocuous) technical measure can lead to outsiders arrogating to themselves the power to 'cry famine' at the expense of the local people suffering. (p.30)

'Power' in these observations (ibid.) might be appropriated as a capacity, "a commodity" or a "piece of wealth", localised to an extent, and not entirely Foucauldian. The observations, however, suggest an important point: as far as "famine" is concerned, the boundary of 'network of consensus' is based on the state of the physiques of 'rural people'. On one hand, their physiques are confronting forces: 'the famine victims live (or die)' (ibid.). On the other hand, they are also peripheries of 'network of consensus' since they are parts of 'societies': they live or die 'under an alien definition' (ibid.). The 'alien definition' is always an outcome of autonomous evolution of

discourse. The point to be noticed here is that narrow contemplation of the mechanism of 'network of consensus' is as misleading as exclusive observation of clash of forces on 'rural people'. Both of these would lead to an Epimenidean paradox sooner or later. The former might gain *our* 'knowledge' of components in 'power' such as 'societies' and 'the specialised agencies'. This, however, only reforms the 'network of consensus', which would not have effects at its peripheries. An exclusive observation of the clash of forces on 'rural people' might increase *our* 'knowledge' of "famine". Its consequence would be, again, only the reformation of the 'network of consensus' because 'knowledge' would belong to *us* and keep 'the local people suffering' as peripheries after all. The viewpoint required here needs to be at a meta-level. It seems that aggregated efforts have to be made to keep three things in perspectives: 'power', force and the boundary between them.

The boundary between 'network of consensus' and forces is an even more puzzling matter in issues such as "drought" and "development". Wilhite (1993, p5) writes:

> It must be accepted that the importance of drought lies in its impacts. Thus definitions should be region and impact or application specific in order to be used in an operational mode by decision makers.

Following this comment, he describes types and characteristics of drought, then classifies 'impacts of drought' into three principal sectors: economic, environmental, and social (ibid.). In the table featured in his writing (ibid.), 19 principal impacts, such as 'loss from crop production' or 'cost of new or supplemental water resource development', are included in the economic sector, seven impacts such as 'damage to animal species' or 'visual and landscape quality' in the environmental sector, and eleven impacts such as 'food shortages' or 'population migration' in the social sector. Seven of those principal impacts are further divided into sub-categories. For example, 'loss from crop production' is divided into six sub-categories: 'annual and perennial crop loses',

'damage to crop quality' and so on. The spectrum is wide. Consideration of Warren and Agnew (1988, p17) seems to echo this view:

> The term "drought" needs to incorporate a measure of the effectiveness of the climate for a specific purpose, be it the maintenance of an ecosystem, or of livestock herds. One should be able to define a "pastoral drought" or an "ecosystem drought" or a "millet drought". Drought would then be defined in terms of land use, and it follows that if the land use were to change, the frequency of drought would also change, without a necessary change in climate...

Then, what are those impacts of drought on? They are cracks on a 'network of consensus', which are made by forces. Consequently, they outline peripheries of the domain of 'power' playing roles in "drought". Contrasting with "famine" in which 'power' and forces can be clearly identified in the physiques of 'rural people', the periphery of 'power' in "drought" is more multi-dimensional. It should be noted that the impacts listed in the table in Wilhite (1993) are the result of clashing forces not just on human physiques but on human perceptions of value as well. While "famine" is sharp, "drought" is blunt.

The human sense of value plays an even greater role in "development". Ferguson (1990, p15) writes:

> It is clear in reading scholarly literature on "development" that the word "development" is used to refer to at least two quite separate things. On the one hand, "development" is used to mean the process of transition or transformation toward a modern, capitalist, industrial economy — "modernization," "capitalist development," "the development of the forces of production," etc. The second meaning, much in vogue from the mid 1970s onward, defines itself in terms of "quality of life" and "standard of living," and refers to

> the reduction or amelioration of poverty and material want. The directionality implied in the word "development" is in this usage no longer historical, but moral.

Morality is essentially a sense of value. It is possible to say that "development" as a whole has become far more multi-dimensional, abstract and complex, as it started involving moral aspects. There could be ways to describe parametrically "development" in the first meaning, but with poor precision in the second meaning. It is, of course, inappropriate to compare "development" with "drought" or "famine" . While the former is essentially an action to be made, the latters are phenomena which occur. The important implication is that "development" is implicitly confrontational against forces for example disease, and is an explicit crusade against poverty. Poverty is, in the context of " development", assumed to be a hindrance for fulfilment of a moral destiny. Poverty is, in the same context, assumed to be caused by factors not having been tamed, in other words, 'forces'. 'Forces', as oppositions to "quality of life" or "standard of living", have not induced the emergence of a 'network of consensus', that is 'power'. 'Forces' are at blind spots within, and outside of, 'power'. In short, "development" is a process through which a 'network of consensus', 'power', expands and reforms its domain. "Development" is the development of consensus, 'power' which enables social and economic change. What complicates this composition in reality is the diversity of the moral aspects of "development". Morality, as a sense of value, is not a solid, undisputed and unified concept, and it changes its emphasis from time to time, in the contemporary world. Consequently, with morality as the driving engine, the context of "development" includes peripheries and blind spots in the 'network of consensus' everywhere.

Two points have to be noted from the discussion made so far. Firstly, the domain of 'power' in "development" is dynamically schismatic. It is not like a monolith; it is unpredictable. "Development" dynamically disintegrates and reforms itself as it is committed to a diversified and changing sense of morality and values. Secondly, the boundaries between 'power' and 'forces' in "famine" and "drought" overlap with those in "development" to a very large extent. "Famine" and "drought" in Africa are almost always placed in the context

of amelioration of their impacts on societies. It has to be remembered that the comment made by De Waal (1989) in his study of "famine" featured earlier mentions 'a perceived moral imperative' of 'foreigners'. These two points suggest that the dynamically schismatic nature of 'network of consensus' in "development" applies to "drought" and "famine", unless the latter are to be considered in a strictly phenomenological context. An interesting question arises at this point: how can the schismatic nature of the discursive process, 'power', be interpreted? Ferguson (1990, p20) mentions Foucault's renowned analysis (1979) on the prison, quotes from it, then states:

> ...planned interventions may produce unintended outcomes that end up, all the same, incorporated into anonymous constellations of control — authorless 'strategies," in Foucault's sense ..... — that turn out in the end to have a kind of political intelligibility. ..... the most important political effects of a planned intervention may occur unconsciously, behind the backs or against the wills of the "planners" who may seem to be running the show.

This neo-Foucauldian viewpoint is attentive, and may explain the schismatic nature of 'power', but prudence is still required here. The schismatic nature of 'power' in "development" as well as in "famine" and "drought" may be more dynamic than Ferguson think. The neo-Foucauldian view explains why the nature of 'power' is schismatic at one moment, but might not account for why the discursive process keeps rapidly changing the nature of the schism. Moreover, in the contemporary world, what is politically intelligible will never be unconditionally clear, so that nothing is politically intelligible. This is an appropriate moment to recall the second set of domains which consists of virtuality where 'power' is a collective illusion, and the outside of the illusion shown as figure 1.2.2 earlier.

1.3 Baudrillardian simulation and Foucauldian 'power'

> Whereas Foucault analyzes discourses, practices and institutions which exercise power and knowledge, Baudrillard analyzes how media, information technologies and simulations function to transform contemporary society and everyday life
>
> (Kellner, D. 1989. Jean Baudrillard : from Marxism to postmodernism and beyond, p141. Polity Press in association with Basil Blackwell, Cambridge.)

The focus of comparison between the first and second set of domains (see figure 1.2.1 and 1.2.2) is the question whether or not the dynamically schismatic 'power' in "development", "drought" and "famine" should be still considered *real*. This is essentially a mutual testing of appropriateness of Foucauldian notion of 'power' to Africa in the contemporary world and validity of more recent Baudlliardian concept of *hyper-reality*. We have taken a brief look at "famine", "drought" and "development" in a Foucauldian analysis in the last section. Now, Baudrillard's critique (1987) on Foucault will be employed to examine the applicability of Foucauldian thoughts to geographical information on Africa. Baudrillard (ibid.) uses Apolinaire's comment on time and an excerpt from Kafka's novel combined with a graffiti in Los Angels as analogies of Foucauldian 'power'.

> "When I speak of time, that's because it's already no longer there," said Apolinaire. But what if Foucault spoke so well to us concerning power — and let us not forget it, in real objective terms which cover manifold diffractions but nonetheless do not question the objective point of view one has about them, and concerning power which is pulverised but whose *reality principle* is nonetheless not questioned — only because power is dead? Not merely impossible to locate because of dissemination, but dissolved purely and simply in a manner that still escapes us, dissolved by reversal, cancellation, or made hyper-real through simulation (who knows?). (ibid. pp11-12)

> ..... and if one speaks about it so much and so well, that's because it is deceased, a ghost,

> a puppet; such is also the meaning of Kafka's words: the Messiah of the day after is only a God resuscitated from among the dead, a zombi. (ibid. p60)

For Baudrillard's, Foucauldian 'notion' of power is outdated, and irrelevant for the contemporary world where Foucauldian normalisation is already replaced by simulation. In the Foucauldian view, *discourse* consisting of a set of 'knowledge' monopolises a society through consensus and normalisation, and controls the mode of individuals' practices. Foucault argued that 'power', a network of consensus, comes into existence as an autonomous entity. In this context, as explained before, 'knowledge' is produced through the formation of a constellation of forces. Baudrillard (ibid.) does not reject this view, but rather suggests to forget it. He considers that the stage of history in which 'power' could be created on the ground via *real* relationships among actors and forces is over. In the Baudlliardian view, 'information' rather than 'knowledge' plays the greatest role as the subject for 'simulation' rather than normalisation. Baudrillard (ibid., p61) writes further:

> This universal fascination with power in its exercise and its theory is so intense because it is a fascination with a *dead* power characterized by a simultaneous "resurrection effect," in an obscene and parodic mode, of all the forms of power already seen — exactly like sex in pornography.

Baudrillard claims that information in the contemporary world is detached from the *real*. In his view, the *real* is defined as '*that of which it is possible to give an equivalent reproduction*', while virtuality, or we can replace this term with *hyper-reality*, as '*that which is always already reproduced*' (Baudrillard, 1983, p146). Simulation, the ultimate effect of this era of communication, is the process of such reproduction. An important point to be noticed here is that simulations make the *real* disappear as they start multiplying within *hyper-reality*: a simulacrum starts creating another simulacrum, and a symbol starts creating another symbol, without

any tie with the original state of the *real*. The autonomy of simulation is more radically dynamic, multiple and rapid than that of normalisation in Foucauldian notion of 'power'. From this point of view, the schismatic nature of 'power' mentioned at the end of the previous section can be interpreted as a result of simulation and the disappearance of *real* 'power'. Baudrillard (1987, p49-63) considers that, like the Messiah in Kafka's novel or sex in pornography, Foucauldian 'power' in the contemporary societies is already functioning simply as a symbol without having fixed meanings. Thus, in the Baudrillardian context, it is to be understood as a collective illusion.

What does the difference between the Foucauldian and Baudrillardian thoughts imply for this study? Kellner's (1989, p140) comments in his critique on Baudrillard's critique on Foucault are interesting in consideration of this question.

> ..... it is hard to keep from losing patience with Baudrillard, given that we live in a world in which unequal power relations and repression produce massive suffering, incarceration, torture, murder and the slow death of lifeless life on a massive scale.... On Baudlliard's account, such things as human suffering and institutions that produce suffering, like prisons, mental institutions, sexual repression and practices, and the work place have no real significance; they are simply simulations without real power, efficacy or importance for the critical critic. But while these phenomena may not be real for the postmodern theorist sitting in his Paris apartment, puffing on his Gaulois or Cuban cigar with defiant pen in hand, for those condemned to work for a living or condemned to live in prisons, hospital and mental institutions, they are too real.

Some may add people in many parts of Africa to the list of the sufferers. At this point, Baudrillard would, perhaps, point out the disturbing possibility that such an anger is just another simulation of "human good will"

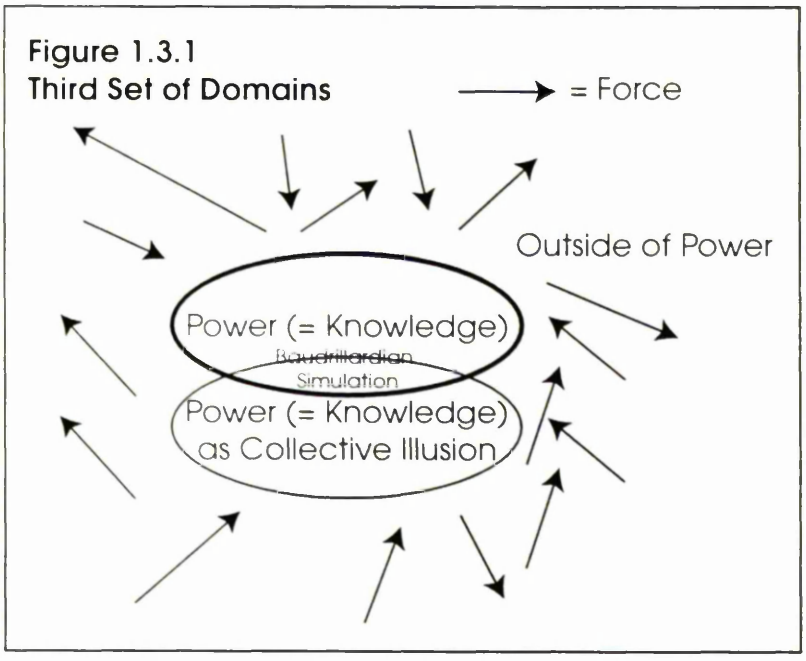
to be consumed and to produce another simulacrum in the contemporary *hyper-capitalistic* societies. It is worth remembering that De Waal featured earlier mentions 'outsiders arrogating to themselves the power to 'cry famine' (1989b, p30)'. Yet the inspiring point of Kellner (1989, p141) is that, despite of the antipathetic view towards the attitude of Baudrillard, he thinks that Foucauldian and Baudlliardian thoughts can be supplementary to each other.

> In our capitalist democracies, political advertising and politically managed media politics attempt to manipulate desire and fear into channels sympathetic to various power elites and their values and institutions. Here a combination of Foucaultian and Baudrillardian analysis might help us to examine current forms of desire and power. Whereas Foucault analyzes discourses, practices and institutions which exercise power and knowledge, Baudrillard analyzes how media, information technologies and simulations function to transform contemporary society and everyday life.

Further to this comment, Kellner (ibid.) emphasises the necessity of 'a multiplicity of perspectives to analyse the phenomena and dynamics in our current social situation'. He claims that, in the contemporary world, 'we frequently need a variety of theories and strategies to deal with diversified situations (ibid.). Some examples of such situations mentioned by Kellner are: 'oppressive bureaucracies'; 'the more subtle forms of disciplinary or normalizing power'; 'political or religious simulacra'; 'media signs which attempt to seduce us into purchases, normalized behaviour, voting'; or even 'certain kinds of classical political power' such as 'imperialist foreign policies or repressive legislation' (Kellner, 1989, p142). This notion is based on an assumption that 'we are currently in a transitional non-synchronic social situation in which we live in many worlds at once (Kellner, 1989, p141)'. The direction pointed out by Kellner is reasonable, but careful attention is required here. In 'our current social situation', we do not confront a Foucauldian problem this week, and a Baudrillardian problem next week. The situation is not non-synchronic in that way. It is non-synchronic in a more complex way that a

problem is a problem in different ways in different dimensions or at different levels as 'we live in many worlds at once (ibid.)'. Moreover, the number of worlds, or dimensions, where a problem lies or a person lives in, changes frequently. A problem, or an issue, is often both Foucauldian and Baudrillardian at the same time. For example, a phenomenon is unlikely to be purely 'the subtle form(s) of disciplinary', it is likely to be 'political' simulacra', 'media sign' or whatever as well. There are not many types of problems, but every problem consists of many different aspects. Such aspects are tied together as a problem or issue only by a word such as "famine" or "drought", and they are always subject to being tied together in another way by another word such as "development". Can simple utilitarian deployments of Foucauldian and Baudrillardian thoughts be functional? Are not such attempts Baudrillardian simulations at a meta-level? Even if it seems practical to combine Foucauldian and Baudrillardian analysis, how can it be done?

The 'multiplicity of perspective' required in this study needs to be refined on the basis of the following two notions. One of those is that both the first and second set of domains discussed above cannot be rejected, rather they should be integrated for this research. The new third set of domains shown as figure 1.3.1 consists of: 1) forces; 2) Foucauldian 'power'; and 3) Baudrillardian simulations. It is still unclear how each of these domains



is contiguous to or overlapped by another. A breakthrough in understanding this uncertainty, however, can be noticed in the consideration of Foucault's and Baudrillard's themes in the preceding section. It is that, at a deep level, the difference between Foucault and Baudrillard is only velocity of multiplication. Foucauldian genealogy of *discourse* and evolution trees of 'knowledge' can be viewed as a form of Baudrillardian simulation. The way in which *discourse* and 'knowledge' multiply themselves resembles the way in which simulacra create other simulacra. The only difference between them is velocity: the Baudrillardian process is much faster than the Foucauldian process. This is because Baudrillard takes contemporary communication technologies into account while Foucault did not. At the same time, this is why Baudrillard thinks that reality of the contemporary world is not fixed by meanings, while Foucault thought that it was possible to trace and to explain the trajectories of 'power' in the contemporary societies. The difference could be considered either small or large in different contexts, but the relevance to this discussion are the following:

1) Foucault and Baudrillard are neither exclusive to nor harmonious with each other; and

2) the mode of communication determines which is more explanatory and appropriate in a circumstance.

We cannot reject either of Foucauldian and Baudrillardian analysis specifically because, even within one issue, velocity of multiplication can be very fast as Baudrillard assumes in some aspects, but may not be in other aspects: we live in non-synchronic situations. Especially when "African issues" such as "famine", "drought" or "development" are concerned, it is very sensible to assume that velocity of communications, or streams of information, among actors involved are neither universally low nor high. In this context, relationships of the three domains can be possibly revealed by observation of the mode of communication, which conditions the velocity of multiplication of 'knowledge' / information, among actors.

The other crucial notion for this study is supplementary to the first notion, and methodologically suggestive. It is that the perception of an actor is a reflection of the location of the actor in the particular domain at a point in time to a very large extent. There should be a significant difference between perception of an actor located in a

domain and that of another actor located in another domain. There might be a significant difference even between perceptions of two actors in the same domain. For example, an academic such as Sen (1981) may perceive starvation as 'the characteristic of some people not having enough food to eat' but not 'the characteristic of there not being enough food to eat'. On the other hand, for a farmer in "famine", starvation could be a direct and painful experience which is likely to push himself / herself and his / her family into ill-health and death. The academically subtle perception of Sen (1981) is likely to be foreign to perception of the hypothetical farmer. These two people clearly belong to two different domains. Or, for another example, as De Waal (1989, p9) quotes in consideration of concepts of "famine", the contrast between a Sahelian herder's remark (Laya, 1975) and Sen (1981) can be looked at.

> Question: Was there a famine after Dan Muubi [about 1953]?
>
> Answer" Yes. No one died, but the price of millet rose. When the sack of millet costs 60000 francs, isn't that a famine?
>
> (Diulde Laya, 1975, p 88)

> Famine is a particularly virulent form of [starvation] causing widespread death.
>
> (Sen 1981, p 40)

These differences in the perspectives of actors will be utilised in this study to analyse the mode of communication. These perceptions become initial inputs for both Foucauldian and Baudrillardian multiplication. For example, such multiplications shall be, hypothetically, developed in the following way:

1) From a Foucauldian viewpoint, there are only truths but not the truth. Interpreting the above examples of the definitions of Laya and Sen in such a context, none of those perceptions is the truth of "famine": they are only truths of "famine" respectively for each of the actors. They could be matrices for generations of *discourses* about "famine".

2) The Sen perception is, however, a perception held at the heart of our 'network of consensus', that in academia — 'knowledge' is 'power', and therefore it is most likely to gain credibility, to function as a *discourse* which functions as the truth, to be institutionalised, to reform the relationships of actors, and to vitalize 'power'. This, however, does not mean that the practice based on Sen's argument necessarily causes intended results in the field, but it only induces political intelligibility on the surface and anonymous, or autonomous, constellation of control at deep levels. With this notion, it is possible to say that Sen (1981) is deeply inside of the domain of Foucauldian 'power', while the hypothetical farmer and the Sahelian herder are on its periphery.

Perceptions of a few more hypothetical actors can be added to this story: audiences of TV programmes showing the hypothetical farmer's children dying in "famine; producers of such TV programmes; and NGOs.

3) Perceptions of the TV audiences and producers are ideal matrices for Baudrillardian simulation: they start self-perpetuation to seek for more victims of "famine", and the meaning of individual death quickly vanishes in their perceptions.

4) The NGOs perceive the *discourse* originated from Sen (1981) merely as the starting point for their field practices and implementation of famine early warning systems, and generate newer *discourses* by taking perceptions of other actors such as the Sahelian herder's comment featured in Laya (1975) or De Waal (1989) into account.

5) The NGOs may still be within the domain of Foucauldian 'power', but close to its boundary with the domain of Baudrillardian simulation as the NGOs' staff are the TV audiences as well. Then, the NGOs' newer *discourses* branched out from Sen (1981) become subjects for simulation and infomatic mass consumption, and become evident in the NGOs' monthly or quarterly reports and summaries.

Thus, actors, ranging from farmers in the Sahel to foreign TV audiences, involved in, or inquisitive about,

"famine", "drought" and "development" denote and connote. Gaps between their denotations and connotations indicate their perceptions and hence their locations in the domains. Although the three domains being discussed are not physically spatial, the method of geographical thematic mapping is applicable here to an extent: sampled actors' perceptions could be utilised to detect boundaries between the domains.

Such mapping of the mode of communication may appear to be a useful method of analysis, but prudence is still required in three ways. Firstly, the "terrain" of the mode of communication cannot be geometrically described. What is possible is only to recognise topological relationships of the domains. This is because, unlike geographical features on the ground, locations of actors in the domains are not definitive in any coordinate system. Moreover, this topological nature of locations of actors in the domains is further complicated by the time factor: an actor may go from one domain to another. Attention would be required to observe changes through time and the nature of the nodes of streams of 'knowledge' / information. Secondly, the gap between what an actor denotes and connotes is context-dependent: an actor's denotation may become an connotation in a different context, or vice versa. Thirdly, and most importantly, one who attempts to develop such topological mapping of the mode of communication is also an actor located in one of the domains. The perception of a researcher, such as the writer of this study, also reflects his / her location in a domain. This point is fundamental. A clear example of the Epimenidean paradox, which is explained at the beginning of this chapter is present. Just as Baudrillard (1987) discerns that Foucault's discovery about the function of *discourse* is not more than a *discourse* of power, a researcher needs to notice that his / her topological mapping of mode of communication is not more than a reflection of his / her own perception, subjectivity, and hence location in the domains. This means that output from his / her efforts can never be the truth, but only a candidate for yet another *discourse* or a potential matrix for simulation. This point can lead this study to an epistemological stalemate, and therefore demands serious consideration. The dilemma will be addressed in the next section.

1.4 Conceptual point of departure

A stag at bay needs to manipulate what is perceived and how the perception would be interpreted to become a dangerous foe. It is possible to take advantage of the third, most fundamental, methodological precaution, namely the Epimenidean paradox of the mapping of the mode of communication, mentioned at the end of the last section to define the conceptual point of departure for this study, instead of regarding it as an impediment. A rather casual remark made by Foucault featured as the title leaf of Baudrillard's interview with Lotringer (Baudrillard, 1987, p65) inspires a possible breakthrough.

> "As in judo, the best answer to an adversary manoeuvre is not to retreat, but to go along with it, turning it to one's own advantage, as a resting point for the next phase."

Any output from perception analysis and consequent topological mapping of the mode of communication will be yet another contribution to the autonomous mechanisms described by Foucault and Baudrillard. It is, however, necessary, and might be possible, to go along with it, turning the death of the truth to one's own advantage, as a resting point for the next phase. The important question to be considered first is who the 'one' is: who should respond to 'an adversary manoeuvre'? As early as 1967, Eco (1987, p141) discussed this question:

> There exists an extremely powerful instrument that none of us will ever manage to regulate; there exist means of communication that, unlike means of production, are not controllable either by private will or by the community. In confronting them, all of us, from the head of CBS to the president of the United States, from Martin Heidegger to the poorest fellah of the Nile delta, all of us are the *proletariat*.

The stag at bay, which needs to manipulate its denotation and connotation, is each of us ranging from officials of international and domestic governments to farmers and herders in the Sahel, from academic researchers to "famine" victims, from militia in Sub-Sahara Africa to TV audiences, from "developers" to the "landless". The dangerous foe for the mechanisms described by Foucault and Baudrillard is an individual who is, being aware of his / her location in the mechanisms, responsible for meanings of information which surround himself / herself to his / her own 'reality' by continuously inventing tactics to use information flows as armouries. The Zapatista in Mexico, who will be looked at and whose possible implications to geographical information of Africa will be considered in the later chapters, are a clear example of such a dangerous foe. In this context, perception analysis and topological mapping of the mode of communication becomes a gambit to make reverse uses of Foucauldian and Baudrillardian multiplications of information, and is employed as a basic strategy in the later chapters of this study. More concretely, the strategy is expected to have three effects:

1) Such analysis and topological mapping could be multiplied and become a node of Foucauldian genealogical tree of *discourse*. This can bring an updated 'network of consensus' come into existence wherever necessary.

2) At the same time, such analysis and topological mapping could introduce points of resistance against the autonomy of Foucauldian 'power' for individuals who are directly facing forces at its peripheries. Such individuals become able to revise 'power' by inventing their own tactics.

3) Such analysis and topological mapping, like a computer virus, could multiply itself at the velocity of simulation in the Baudrillardian domain. Consequently, each of the actors in this domain would be individually forced either to reveal the fact that his / her perception is a simulacrum or to rethink his / her involvement in issues such as "famine", "drought" and "development".

With these possibilities, output from perception analysis and topological mapping of the mode of communication can be not just a candidate for yet another *discourse* or a potential matrix for simulation but a

gambit for the next phase, a curse for Foucauldian 'power' and Baudrillardian simulation, and an exorcism of phantoms of the truth.

A tactical question has to be raised at this point. How could this gambit to gain currency in societies to bring about such 'resting points for the next phase'? This question has to be borne in mind throughout this study. One simple answer, however, may be appropriate at the outset: it can be done by making the gambit interestingly provocative and attractive. This notion leads to the use of two concrete analytical tactics in this study. The first is an examination of the way existing discourses, such as development, function to form perceptions of the actors involved in the scenes. Such an analysis would stimulate attention to a wider range of actors who have been familiar with such discourses. This tactic is also serviceable for exorcising phantoms of the truth: by contemplating such approaches, a number of interesting terms used as self-evident truth, such as interest or humanitarianism can be re-examined in the contexts of Foucauldian genealogy of *discourse* and Baudrillardian *hyper-reality*. Secondly, the other tactic is to design attractive geo-infomatic products based upon perception analysis and topological mapping of the mode of communication. They range from methods of processing data to the manner of the distribution of information. Such products function as catalysts: they are open to technical criticisms, or rather, every criticism is a desirable outcome as it reveals the critic's own perception regardless of his / her will. It is essentially a reverse use of Foucauldian and Baudrillardian mechanisms. An obstacle for these tactics would be a simple disregard of this tactics, but it is not too formidable. Even total disregard of an actor of this type of approach connotes his / her own perception, hence contributes to the strategy.

The conceptual point of departure of this study is thus an investigation of the possibility of creating a particular kind of infomatic virus. The hypothesis of this study is as follows. Geographical information of Africa functions to reproduce and sustain environmental and socio-economic problems in the continent while maintaining various interests of research and decision making communities although such information are supposed to be used for the solution of those problems. The study also contends that emerging communication networks being

most prominently actualised as the Internet have a potential to enable local communities to change the use / abuse of information about themselves and their environments. The study develops the following issues. In this introductory chapter, two epistemological ideas were introduced. They were the Foucauldian concept of power and the Baudrillardian notion of information in the contemporary world. Foucault perceived that knowledge was power in the sense that the behaviour and thinking of individuals were governed by networks of consensus. In his view, power was not to be understood as an asset to be possessed but as a function to be exercised. Baudrillard perceived that the Foucauldian concept of power was no longer valid in the contemporary world in which simulation of information continuously took place everywhere, and recommended that we forget Foucault. Kellner (1989, p141) suggested that 'a multiplicity of perspectives to analyse the phenomena and dynamics in our current social situation' might be achieved by paying attention to both the Foucauldian and Baudrillardian thoughts. This suggestion was examined, and the direction of this study has been guided by such a combination of the two concepts.

In Chapter 2, the Foucauldian context is applied to famine, drought and "desertification" in Africa. Analysis exhibits various aspects of the process in which pieces of information are converted into discourses and then into decisions and actions. Chapter 2 makes two important points. One is that problems in the development and of relief operations are rarely only technical but almost always deeply structural. The lack of reliable data and the self-perpetuation of perceptions and conventional decision making are different aspects of the same mechanism. They are deeply rooted in the composition of environments, and local, research and decision making communities. The other implication is that while it was possible to analyse the ever unchanging structure under changing and evolving scientific discourses, it is very difficult to bring about a fundamental change in the way the regime of power/knowledge is organised. This second implication is termed the 'Foucauldian stalemate'.

In Chapter 3, fast flows of information maintained by mass media are discussed through a comparative study of

media coverages of Africa and the Persian Gulf War. The Foucauldian approach is extended to the analysis of propaganda orchestrated in news and reports of such events. Then, the Baudrillardian concept is introduced to examine the validity of the analysis of such propaganda. It is considered that propaganda, productions of humanitarian consumables for mobilisation of public opinion to support specific interests of decision making communities ranging from governments to NGOs, would lead to the disappearance of meaning in media coverages of events in Africa, and critical analyses of those would have no significant impact on their targets. Images of Africa are, through the proliferation of information, to be fixed as the adventure play ground to fulfil humanitarian sentiments or the formidable place with endless troubles so great that it has to be ignored. Individuals of local communities are only material for humanitarian cannibalism orchestrated by the complicity among the mass media, the decision making communities and the public in "developed" countries. This outcome is termed the 'Baudrillardian stalemate'.

In Chapter 4, observations and discussions are made on the arguments in the two preceding chapters, summarised in graphic form. Attempts are made in this chapter to put discussions in Chapter 2 and 3 into perspective and to clarify the linkage between the Foucauldian and Baudrillardian mechanisms, which lead to an examination of the possible outcomes if individuals are to challenge the world system. Consideration is also given to what would motivate such questioning. Comprehension of the ways in which flows of geographical information function, which could be gained from the graphical explanations in this chapter, implies that individuals in local communities can not help being material to satisfy interests of other communities. It also implies that individuals of other communities are inevitably absorbed into interests and expediencies of their own communities. Realisation of these inevitabilities could, however, motivate an individual to confront vagaries of the world system maintained by flows of information.

In Chapter 5, the possibilities of, and means whereby, individuals could challenge the Foucauldian and Baudrillardian mechanisms are discussed. Activities of the Zapatista and their supporters are useful points of

reference. The adaptation of the Zapatista to the potential of the Internet forming autonomous communication networks through which voices of individuals who would have died in oblivion otherwise were heard and responded to by other individuals not just within Mexico but all over the world. The same tactics could be deployed by individuals to counter the conventional decision making processes in Africa. Telematics for Africa, despite the often poor state of the telecommunication infrastructure in countries on the continent, could be achieved, and the Internet could function as the informatic Trojan Horse to infiltrate into the current world system. In order to achieve this goal, attention would have to be given to impediments to telecommunication development in Africa, and geo-informatic contents for such autonomous communication networks would need to be designed.

In Chapter 6, some examples of the types of geo-informatic products needed for autonomous communication networks are shown, and some examples of appropriate data processing are carried out. The concepts of synoptic, that is overview, and definitive, that is local, contexts for information are introduced to consider the direction of the design. The observation of the contexts in which different geographical information could be accommodated is developed to a discussion about modelling and labelling in social and environmental science. The data sets mostly available in the Internet are processed on the notion that an individual possessing information in one type of context could counter and / or manoeuvre around the Foucauldian and Baudrillardian mechanisms by gaining access to relevant information in the other type of context. The utilisation of such products could lead to the re-examination of consensus networks and hence to the liberation of marginalised individuals.

Throughout this study, the following two terms, 'Foucauldian' and 'Baudrillardian' are used frequently. It is useful to confirm denotations of these terms at this point of the study. The emphasis on the denotations may shift in each usage of these terms. The ideas that the terms signify are, however, within the ranges defined below. The adjective, 'Foucauldian', denotes that the situation, or social mechanism, of interest is:

1) governed by networks of consensus; and

2) engaged in self-perpetuation in which the original situation, or social mechanism, is reproduced repeatedly through processes and efforts of improvements.

The networks of consensus in the first point is 'Foucauldian' concept of power. The second point illustrates the function of 'Foucauldian' power in the forms of ostensible discourses. In the 'Foucauldian' context, a discourse is a hypothesis which functions as truth to be accepted by members of communities. Discourses form networks of consensus, hence 'Foucauldian' power. When terms such as 'Foucauldian' approach or 'Foucauldian' analysis are used, they mean that the approach, or analysis, is based on the understanding of the above denotation. More concretely, such an approach, or analysis, considers functions of scientific discourses in societies but does not attempt to embrace, accept, revise, modify or deny what the discourses denote. In other words, 'Foucauldian' analysis and approach investigate social connotations of scientific discourses.

The other frequently used term in this thesis is 'Baudrillardian'. This adjective in this study denotes that the situation, or social mechanism, of interest is:

1) saturated by proliferating information; and

2) leading to the void where the meaning of every piece of information cannot help being lost.

In 'Baudrillardian' circumstances, even 'Foucauldian' power is overwhelmed by profusion of information, and becomes an illusion. Usage of the term, 'Baudrillardian', as an adjective for nouns such as process, mode of information, information flows or uncertainty are to indicate that what the noun denotes contributes to the circumstance where 'Foucauldian' key-concepts such as power, consensus, discourse and knowledge become imitations. Such imitations multiply themselves and fulfil societies and perceptions of certain communities, then what is not an imitation eventually disappears. While 'Foucauldian' matters are real, 'Baudrillardian' matters are hyper-real. In this study, the possibility that transition from the former to the latter might be taking place quietly or loudly in information-rich societies in the "developed" world has to be borne in mind. Wherever the term 'Baudrillardian' appears in this study, it indicates that the consideration is on the circumstance where

'Foucauldian' understanding is no longer valid and attention has to be paid to the void where both denotations and connotations of information become mirages of themselves.

A point noted earlier is repeated here. None of the statetments made in these chapters is truth, instead, every thought in this study is explicitly intended to be a candidate for yet another *discourse* or a potential matrix for simulation on the themes of development, disaster relief and environment in Africa. The aim of the efforts made in the study is to induce particular kinds of multiplication of information. 'As in judo', or as in any game, there never be an absolute prescription for any move. A good move can be only made by the player who is responsible for his / her own game. The same goes for people in and concerned with Africa, and the purpose of the following chapters are to generate or accelerate streams of information with which each actor could make his / her next move in his / her own 'reality'.

Chapter 2: Foucauldian approach to "famine", "drought" and "desertification"

2.1 Introduction

The purpose of this chapter is to flesh out the entangling concepts identified in the first chapter. This chapter shows, with concrete examples, how Foucauldian thoughts can be applied to environmental and relief operation issues in Africa. The Baudrillardian concepts which are discussed in the first chapter are not featured in this section. This is because utilisation of the Baudrillardian concepts requires understanding of the Foucauldian approach as a pre-condition: Just as the order of procedures is critical in exorcism of ghosts, the order of concepts applied to the "real" cases is crucial for expelling of 'truth' from its reservation. In this chapter, using the Foucauldian approach, the evolution of famine models is looked at in Section 2, institutional information flow in Section 3, data sources for the African case studies completed by Sen (1981) in Section 4, relationships among interests of local, research and decision making communities in droughts in Section 5, and desertification as an institutional myth in Section 6. To read those sections, it is useful to note the following remark made by Foucault (1980, pp131 - 132).

> In societies like ours, the 'political economy' of truth is characterized by five important traits.
>
> 1) 'Truth' is centred on the form of scientific discourse and the institutions which produce it;
>
> 2) It is subject to constant economic and political incitement (the demand for truth, as much for economic production as for political power);
>
> 3) It is the object, under the diverse forms, of immense diffusion and consumption (circulating through apparatuses of education and information whose extent is relatively broad in the social body, not withstanding certain strict limitations);
>
> 4) It is produced and transmitted under the control, dominant if not exclusive, of a few great political and economic apparatuses (university, army, writing, media; lastly,

5) It is the issue of a whole political debate and social confrontation ('ideological' struggles).

(Edited by HY)

Throughout this section, it is not relevant to ask "what is famine (drought or desertification)?", but important to consider "how does famine (drought or desertification) function as an issue in our societies?".

In this chapter, "famine", "drought" and "desertification" are discussed in the grammar of discourse analysis and of 'power as networks of consensus'. In other words, the efforts made in this chapter are inspired by Foucault. The Baudrillardian awareness for *hyper-reality* and *simulation* introduced as the opponent to the Foucauldian thought in the first chapter is not featured in this chapter. This chapter limits its scope to the relatively slow mode of communication, the "classical" frame of evolution of discourse. The concentration on the Foucauldian velocity of information flow provides four analytical outcomes in this chapter:

1) Autonomy of evolution of discourse (Section 2);

2) Schism of Foucauldian power (Section 3);

3) The determinants and characteristics of the arena for the creation of hypotheses (Section 4); and

4) The structure of interests generation, or absence of interests, for the communities (Section 5).

These four outcomes confirm, or actualise, the conceptual approach taken in the first chapter. The application of the above framework to the issue of desertification in Section 6 illustrates how 'those against power always obtain indirect replies (Eco, 1979, p252)'. The most important analytical outcome from the efforts made in this chapter is the dynamic immobility of the Foucauldian structure resulting from the relationship of the research, decision making and local communities. A straight criticism of the structure, even if it is very well conceived and constructed, would only result in the regeneration of the structure as an indirect answer.

Chapter 2 - Section 1

2.2 Evolution of famine discourse

Insights into the evolution of the famine discourse can be achieved via an analysis of the means used by research and decision making communities to describe and ameliorate the phenomenon. An examination of readily developed geo-information systems for the Sahel is a relevant example with which to start. This section shows an example of autonomous evolution of *discourse* which was mentioned in the first chapter. This case study also functions as an instance of the allegory told at the beginning of the second section of the first chapter: a hypothesis functioning as absolute truth, in that case an example in Sahelian Africa.

Buchanan-Smith, Davies and Lambert (1991 a) produced *a guide to famine early warning systems and food information systems in the Sahel and Horn of Africa*. In Volume 1 of the three part series, the authors made a list of binary oppositions to describe characteristics of two polar extremes of opposing systems concerned with food: the conventional famine early warning system and the alternative food information system. The authors clearly state that the two categories are idealised for analytical purposes, and admit that 'in practice there is a continuum of possible cases between the two extremes' (ibid.). With this reservation, the binary oppositions provides the foundation for the rest of their work. In Volume 2, the authors locate 19 systems on the spectrum

	CONVENTIONAL FAMINE EARLY WARNING SYSTEM	ALTERNATIVE FOOD INFORMATION SYSTEM
SCOPE	Famine-oriented	Food security-oriented
DETERMINANTS OF FOOD SECURITY	Food production	Access to food
LEVEL OF OPERATION	Macro Centralised	Micro Decentralised
UNIT OF ANALYSIS	Geographic e.g. nation/districts	Socio-economic e.g. vulnerable groups
APPROACH	Top-down Data-centred	Bottom-up People-centred
RESPONSE	Food aid-oriented	Sustainable improvement in access to food

Table 2.2.1 Typology of Early Warning Systems
Adopted from Buchanan-Smith et al (1991a, p9 and 1991b, p3).

between the poles. One of those was at the global scale, five at the regional scale, seven at the national and six at the sub-national scales. The global, regional and national systems are considered 'top-down' approaches with the exception of Burkina Faso's Early Warning System, and all sub-national systems 'bottom-up'.

The point to be looked at here is the origin of those binary oppositions. How did the spectrum come into existence? The authors state that:

> The design and objectives of an EWS are strongly influenced by perceptions of the cause of famine in particular, and of food insecurity more generally.
>
> (Buchanan-Smith et al., 1991a, p1)

Then, 'developments in understanding famine over the past 20 years' and 'how this has influenced the design of EWS' are chronologically traced and shown:

> Food crises in Africa in the early 1970s were popularly seen to be a problem of food supply. Explanation of famine stressed the failure of food production due to natural causes, especially drought....
>
> (Ibid.)

> Accordingly, the principle objective for EW identified by the 1974 World Food Conference was to warn of impending national level food production failures. The Food and Agricultural Organisation (FAO) was given a mandate to establish a global information and early warning system (GIEWS) based on this objective (FAO, 1985). Typical approaches calculated national food availability per capita, and focused on the planning and execution of food supply management policies. Indicators were developed

> to monitor supply, whilst demand was calculated on the basis of estimates of national population. ...
>
> (Ibid.)

> The primacy of supply-side factors contributing to famine — characterised by Sen (1981) as 'FAD' or food availability decline — was reassessed as access to food, or food entitlements, were taken into account. Famine could best be understood as a failure in effective demand or a collapse of food entitlements. ...
>
> (Buchanan-Smith et al., 1991a, p2)

From this point onward, the authors introduced other concepts echoing, supplementing or challenging those of Sen. They were De Waal (1988), Hesse (1986), D'Sousa (1989), Torry (1984), Chambers (1989) and Swift (1989). The chronological review was finally concluded as:

> Thus, by the second half of the 1980s, attention had begun to shift away from crisis-oriented EWS....
>
> (Buchanan-Smith et al., 1991a, p4)

> As famine models have developed over recent years, conceptual approaches to EW have been modified accordingly, away from food shortage prediction at the national level to assessing vulnerability of particular groups in terms of their access to food....
>
> (Buchanan-Smith et al., 1991a, p4)

In the history of early warning system as perceived by Buchanan-Smith et al., the entitlement approach argued by Sen was clearly the turning point. Sen's argument made in 1981 was radically opposed to the explanation of

famine which prevailed in the early 1970s. It was the seed, and the arguments inspired by Sen led to the binary opposition in approach.

Implications

The autonomous evolution of *discourse* can be clearly observed in the formulation of the binary oppositions looked at above. Every work mentioned in Buchanan-Smith et al. (1991 a) was not produced in a vacuum but completed as a supplement or challenge to preceding studies. Sen's entitlement approach was not an exception. It was also a supplement or challenge to the *discourses* prior to 1981. This evolution of *discourse* was essentially autonomous. It was not designed or conceived. Existing works gave momentum to a new idea, and the new idea stimulated more studies. The direction of evolution was unpredictable, and could not be guided. Each researcher who played any role in the evolution was only aware of the direction of his / her argument in relation to the preceding *discourses*. The evolution was independent from the thought of any thinker. Every work was subordinate to the evolution of *discourse* about famine. The relationship between academic explanations of famine and famine early warning systems was not one-directional. Also it was not the case that the academic explanations were "applied" to societies in the forms of the famine early warning systems. Rather, academic explanations and the early warning systems interacted with each other around the theme of famine.

Another, possibly even more important, point is that although all the works mentioned above were hypotheses, they mimicked the 'absolute truth' of famine. The fact that the cluster of works as supplements and challenges followed the work by Sen (1981) means that the researchers did not accept the entitlement approach as the absolute truth but as a hypothesis for further examination, reinforcement and refinement. Such follow-up works (eg. De Waal, 1988; Hesse, 1986; D'Sousa, 1989; Torry, 1984; Chambers, 1989; and Swift, 1989 as mentioned by Buchanan-Smith et al., 1991 a) were, again, nothing but hypotheses after all. The hypotheses invoked and

provoked the creation of further incarnations. Actual early warning systems, however, were designed, constructed and implemented utilising these hypotheses as the truth outside of academia. Any of the works could be welcomed as a hypothesis for further study within the community of the researchers but the cluster of hypotheses could become a *discourse* which functioned as the 'truth' to influence the field. The process of hypothesis creation in the research community interacted with the early warning systems set in the field.

Let us apply the analytical frameworks considered in the first chapter to the above two ideas, to the evolution of famine models and to the evolution of EWSs. We can clearly see manifestations of 'power' as perceived by Foucault as a 'network of consensus (Eco, 1979, p247)' to be 'employed and exercised (Foucault, 1980, p98)' in the interaction between the evolution of 'famine models (Buchanan-Smith et al., 1991a)' and the evolution of the actual early warning systems. The whole sequence cannot be converged on any 'consolidated and homogenous domination over others (Foucault, 1980, p98)' by any particular group. This leads to a scepticism on the utility of a "suggestion" or a "proposal" to decision makers to bring about improvements or changes in societies and fields. Between a researcher studying famine models and a field officer of a NGO, between an UN official and a starving child in Africa, all the individuals would be 'the vehicles of power, not its points of application (ibid.)'. The network of consensus comes about via the thoughts of the individuals involved, but its periphery ends at the famine victims who physically suffer starvation and death. It is useful to remember that, as quoted in the previous chapter, De Waal (1989) wrote that 'the famine victims live (or die) under alien definition'. Evolving a definition of famine in academia or in an international agency determines when mitigation measures may be mobilised. Those enduring the famines live or die according to whether there is a mobilisation.

2.3 Definitions of drought and perceptions of communities

As with the evolution of 'famine models (Buchanan-Smith et al., 1991 a and b)', the definition of drought has been experiencing evolution. There have been also interactions between the evolution of drought definitions and societies impacted by drought. Analysis of such interactions highlights the contradictory nature of environmental information for Africa.

Drought is often accepted as a simple meteorological phenomenon described as 'the condition of dryness because of lack of precipitation (Reynolds, 1991, pp138 - 139)'. The simplicity of such a definition may give an impression of scientific lucidity: 'lack of precipitation' should be measurable. For instance, the Indian Meteorological Department recognized a 'drought year' as 'the one in which the actual rainfall received is [was] below the normal by 20% or more (Dhar et al., 1979, p 364)'. With this criterion, the scientists are able to distinguish the period of drought from other 'normal' periods. The scientific advantage based on the simplicity of such a definition, however, does not cope with the complexity of the real world. Although precipitation is a crucial item of information, its consequence and meaning do vary in 'reality'. Drought is more than 'dryness because of lack of precipitation (Reynolds, 1991, pp138 - 139)'.

A number of definitions of drought have been made in order to bring "science" into the real world. Warren and Agnew (1987) mentioned two of such attempts:

1) 'A rainfall-induced shortage of some economic good brought about by inadequate or badly timed rainfall. (Sandford 1978, p 34)' ; and

2) 'A period of dry weather of sufficient length and severity of cause at least partial crop failure.

— The U.S. Weather Bureau (Krishnan, 1979, p 74 - 75)'.

The difference between these and the definition of the Indian Meteorological Office mentioned earlier is clear. The former does not embrace the notion for economic effects of the meteorological phenomenon, while the latter do. The economically aware definitions, however, look at only the effects on productivity, but not those

on other utilities of rainfall such as sanitation systems maintained by water supply. Nevertheless the argument of Warren and Agnew (1987, p17) pushed the idea further. Their argument shown in the previous chapter shall be featured here again for consideration:

> The term "drought" needs to incorporate a measure of the effectiveness of the climate for a specific purpose, be it the maintenance of an ecosystem, or of livestock herds. One should be able to define a "pastoral drought" or an "ecosystem drought" or a "millet drought". Drought would then be defined in terms of land use, and it follows that if the land use were to change, the frequency of drought would also change, without a necessary change in climate.

These land use aware definitions could be more sensible in planning and research than a definition relying on the single parameter such as that of the Indian Meteorological Office. A dilemma, however, arises here. Vast amount of information would be required to define and to detect such "land use specific droughts". Who is capable of acquiring, processing and synthesizing such information? More importantly, who can be responsible for administration of such information?

The dilemma deepens further if the behaviour of communities are taken into account. Webb and Braun (1994, p39) think that "drought" affects crop production in two principal ways in Africa:

1) 'The first is that it may affect cropping patterns over the longer term through farmers' perception of the likelihood of drought sequences in their region.' ; and
2) 'The second effect is through a direct impact on crop yields'.

In detection of "land use specific droughts", the first of these two principal impacts (ibid.) could imply two crucial points:

A) The necessity of very frequent information acquisition.

This is because it is not feasible to detect exactly when farmers' perception causes them to change cropping pattern (land use); and

B) The necessity of information with high spatial resolution.

This is because, as Webb and Braun (1994, pp39 -40) note, the way that farmers try to minimize the risk of "drought" is diversification of their crops and income sources, therefore land parcels are inevitably divided into small units for different purposes.

These criteria would have to be fulfilled to assess the direct impact of "drought" on crop yields, the second effect, in the context of Warren and Agnew's argument. Neither contemporary technology nor any existing institution has the capacity to meet the information requirements for the maintaining of any large tract in Africa.

The perceptions of decision making communities and research communities make the issue more complex. "Drought" perceived by a government or an international organization (decision making communities) is not necessarily the same as "drought" perceived by farmers. Similarly, "drought" perceived by research communities is not necessarily equal to "drought" perceived by decision making communities. The gaps between the diverse perceptions of these communities sometimes induce not only a confusion but an actual disaster. Kent (1987) reported a symbolic example. In 1984, Ethiopia experienced a severe "drought", and a consequent famine. Perception of UNDRO appeared to be strikingly different from that of local communities in this case.

> Despite clear indication on the ground that famine was intensifying, UNDRO maintained there were signs that conditions in Ethiopia were improving. UNDRO's assessment was principally based on satellite observations. The fact that the 'green' spotted by the satellite was that of acacia trees was missed, leading one Oxfam official to comment that all the satellite had uncovered was 'green starvation'.

(Kent, 1987, p 22)

Using the concept of "land use specific drought", this Ethiopian case was not a severe "ecosystem drought", but a severe "crop drought" or a "pastoral" drought. The acacia trees maintained greenness, while local population suffered from famine. UNDRO perceived absence of "ecosystem drought" as recovery of "crop / pastoral drought". It may look like a relatively simple technical confusion. However, should this be simply regarded as a technical failure?

The true mystery of this story is the connection between UNDRO and its remote sensing scientists. The moral drawn from this example by Kent (1987) was the necessity of field checking. One should, however, question who were able to, and responsible for, the completion of field checking, and the feed back of the ground information for comparison with the remotely sensed data. The necessity of 'ground checking' had been recognized by remote sensing communities since the era of aerial survey, yet it did not appear to be a part of UNDRO's procedures. A number of possible explanations can be considered, for example:

A) The remote sensing scientists supplied synoptic information to UNDRO with mention of the necessity of 'ground checking, however UNDRO did not acknowledge it for some reason;

B) The remote sensing scientists did not mention of the uncertainty for some reason, and UNDRO did not realise the necessity of 'ground checking'; or

C) The remote sensing scientists thought that the necessity of 'ground checking' was minimal as they extrapolated acquired land cover information to land use information with confidence based on "empirical knowledge", and UNDRO believed the scientists' assumptions.

The point to be noted in these three examples is that the technical capacity of UNDRO. If UNDRO, as an organization, had enough technical capacity to absorb the scientists' suggestion, possibility of the case A could

be reduced. On the other hand, it is very difficult to minimize possibilities of the cases B and C because, by definition, the scientists possessed the authority of science and their words would have to be accepted by "non-scientific" officials of UNDRO. The only way that UNDRO could lower such possibilities was, presumably, to consult a number of external scientists. The following question has to be asked. Was it possible for UNDRO to take those precautionary measures as well as to implement field checking and to feed back to the synoptic information in time? The way that "drought" affects local communities and ecosystems could be incredibly dynamic and diverse. 'Ground truthing', or understanding of perception of local communities, needed to be a daily task, as well as a foundation for relief operation, to be executed by research and decision making communities. It is, however, not feasible for any existing institution. The lack of institutional capacity is not simply a technical failure, but is a structural issue.

Implications

A phenomenon becomes a drought when it is perceived as a drought by a group of people, an organization or a community. The criteria to determine whether or not a phenomenon is a drought differ from one community to another. This effectively separates communities: it is extremely difficult for one community to assume how another community perceives the same phenomenon. Unmanageable amounts of information and procedures would be required to make such assumptions with confidence.

This absence of mutual understanding has two implications. One of these is the low feasibility of successful acquisition and utilisation of environmental information for Africa in a conventional manner. The difficulties of environmental information capture in Africa relates to both data quality and quantity. Even if the requirement is fulfilled, the processing and interpretation of the "vast amount of quality information" would encounter another level of difficulty. These difficulties are likely to be beyond the limit of feasible reinforcement to technical

capacity of institutions for the forseeable future. In a place like Africa, it is not easy to set up a monitoring system to acquire information not just from local communities but also from their environments and to process and interpret such information.

The other implication is schism of the Foucauldian 'power' on the issue of drought. One network of consensus might be linked with another, but it is hard to stretch all the networks of consensus to match together. The schismatic nature of 'power' in the activity known as "development" mentioned in the previous chapter was due to the diversified and changing sense of moral value. Similarly, the network of consensus vis à vis 'drought' can never be a monolith because of the different perceptions of the different communities involved. It is necessary to identify the two types of schisms of the Foucauldian 'power': one is the schism of 'power' within one community; and the other is the schism of 'power' among the different communities. Just as the "famine model" has been, and is, experiencing an evolution, the definition of drought has been, and is, experiencing an evolution. The nature of the research communities is to produce clusters of hypotheses but not the definitive definition of drought. The clusters of hypothetical definitions of drought cause schism in the drought consensus all over its network. The two types of schisms of the Foucauldian 'power' derives from the fact that variation of such schism at the inter-community level is larger than that within one community.

The first clue to carry out the topological mapping of the mode of communication proposed in the previous chapter seems to be emerging from the issues discussed in this section. The first and second implications, namely the low feasibility of successful acquisition and utilisation of environmental information for Africa in a conventional manner and schism of the Foucauldian 'power', are related to each other. The communities are separated by available information. The communities create new pieces of information from originally available information. The modes of communication are the circuits in which such processes of information creation take place. The notion of the schism of Foucauldian 'power' within one community and between different communities gained in this section will offer a useful insights into topology of the mode of communication.

This shall be looked again and utilised in the later chapters of this thesis.

2.4 Data in African case studies of famine by Sen

Data collected from the field are, in theory, for testing or confirming the trustworthiness of an idea, or for putting shapeless 'reality' into a form in the process of building an idea. Data ties up an idea with the material world. An idea can be logically consistent by itself, but its relevance to communities, societies and their environments depends on nature of data on which the idea is based. Let us come back to Sen's work (1981) which was looked at in Section 1 of this chapter. In this section, Sen's studies will be looked at with special attention to the data used. The purpose is to show an interesting paradox: 1) Even the persuasive social scientific

Chapter 6: The Great Bengali Famine	**Chapter 7: The Ethiopian Famine**	**Chapter 8: Drought and Famine in the Sahel**	**Chapter 9: Famine in Bangladesh**
Indian Trade Journal (1942-43)	Ethiopian Ministry of Agriculture (1973)	2 instances from FAO Production Yearbook (1976)	10 instances from Alamgir (1980)
Famine Inquiry Commission, India (1945,	2 instances from Hussein (1976)	FAO Production Yearbook (1975)	3 instances from Alamgir et al. (1977)
Log books in Sriniketan Dairy and Farm	FAO Production Yearbook (1971, 76)		2 instances from Alamgir (1978)
3 instances from Agro-Economic Research Centre for East India	National Bank of Ethiopia (1970, 71)		Mia (1976)
Calcutta Municipal Gazette (1941-43)	Ethiopian Grain Agency (1972, 73)		Bangladesh Institute of Development Studies
Mukherjea and Ghosh (1946)	Betele et al. (1977)		Village Study Group in Char Samraaj reported in Islam (1977)
Mukerji (1965)	2 instances from Seaman, Holt and Rivers (1974)		Khan (1977)

Table 2.4.1 Sources of data used in 'Famines and Poverty' (Compiled from Sen, 1981 Chapter 6 - 9)

assumption for Africa by Sen (1981) cannot be tied up with 'reality' very well because of the poor quality of available data; 2) Such a social scientific assumption is, however, accepted as the current tangent to 'reality' by

research communities thanks to the quality of logic.

A remarkable point of *Famines and Poverty* (Sen, 1981) is its structural clarity. The book consists of 10 chapters: the first four chapters explain and examine the concept of entitlement, the fifth chapter to the ninth chapter feature case studies taken from South Asia and Africa, and the final chapter concludes. This composition resembles swinging of a seesaw: the concept of entitlement functions as the pivot; the arm of the seesaw are the author's rationalisation; references to preceding works by himself and others are placed on one end of the arm; quantitative data from various sources are placed on the other end; and weight is given to the first end in the initial conceptual chapters, then to the second end in the case studies, and it all balances in the end. Throughout this swinging, the author's rationalisation tightly links via the pivot every item of information on both sides. This dynamic yet neat development of the argument persuasively demonstrates the concept of entitlement: it seems to survive tests of time as it is supported by data available to the author at the time of his analysis.

By closely looking at the analysis in *Famines and Poverty* (Sen, 1981), two points can be noticed. First, usage of the references changes. While they are used to locate the concept of entitlement in the history of economic analysis of famine in the first five chapters, they are used to aid interpretation of the data or to compensate their defects in the case studies. Second, variation of the data source fluctuates from one case study to another. This point shall be examined further here. Table 2.4.1 shows the data sources in each case study. These data are all presented as tables in *Famine and Poverty* (ibid.). Many of those are organised in a chronological order: the first column or row of such tables shows years. On some of those tables, data from multiple sources are combined to maintain chronological continuity. Four points should be noted:

1) The Great Bengali Famine studied in Chapter 6 took place a few decades before the other famines studied in Chapter 6, 7 and 8;

2) Sources of data, types and numbers of organisations which compiled data, used

in the Bengali case study in Chapter 6 are most varied;

3) The African case studies in Chapter 7 and 8 heavily rely on data from agencies of a national (Ethiopian in Chapter 7) government or an international agency (FAO); and

4) The Bangladeshi case study in Chapter 9 heavily rely on data from a research institute (Bangladesh Institute of Development Studies) mostly through Alamgir's works in 1980.

These points may inspire several interpretations. For example, the reason that the Bengali case study had to feature the wide variation of data source could be that there was no single organisation which was able to compile data to maintain the chronological continuity in the 1930s to the 1940s. These interpretations would need careful examination as many factors must have been involved in the process that Sen followed in collecting and selecting data for his rationalisation. Complete and detailed analysis of such investigations is beyond the scope of this section, however, the third point, the narrow variation of data source in the African case studies, needs to be contemplated to evaluate the nature of geographical information for Africa.

Nigerian statisticians, Kpedekpo and Arya, openly discuss sources, uses and limitations of African data in *Social and Economic Statistics for Africa* (1981). In Chapter 1 of this work, they write:

> The central statistical organisation of African countries has been assigned the responsibility of publishing data relating to the particular country's economy. These organisations periodically bring out publications for this purpose. The frequency of publication ranges from one month to one year. However, the coverage of the various aspects of the economy depends on the availability of resources (both human and financial). (p. 2)

The main sources of data that are used by governments and by economic researchers are official statistics and statistics collected through surveys. Official statistics are incidental to the process of administration and are collected continuously by various government departments and institutions. They do not cover all the areas on which information is needed for guiding policies, and even in the areas for which they are available, the data tend to be incomplete, inconsistent (because uniform concepts and definitions are not specified), biased (because they are affected by the primary purpose for which they are collected, e.g. revenue from rates and taxes) and often out of date (because of the low priority given to their compilation). (p. 11)
..there is the problem of ethnocentricity: that is, an obsession with modernisation and a restriction of the scope of the investigation to the point where the questions supply their own answers. In addition, analysis from the economic standing point is rendered difficult by data that are often much poorer than the analyst realises. (p. 11)
..governments in African countries have at various times interfered with data collection and analysis, thereby contributing to the various problems connected with the quality of the data and their reliability. (p. 12)
..governments can ask the statistical office to manipulate or fabricate data. In the past, census operations of several countries have been suspected of being manipulated to exaggerate the proportional share of particular ethnic, racial or religious groups or regions. (p. 12)
..the statistical office can be requested to suppress inconvenient data. This is a regular practice in many countries. The politicians in power justify this on the grounds of public policy. (p. 12)
..in several countries, while the government would not favour outright suppression of data, attempts are made to lessen the impact of unfavourable data by inducing the statistical tables to hide some individual items under aggregate figures, or ..(p. 12-13)
..sometimes as a result of pressure from international and, in some cases, bilateral agencies on national statistical offices to fill in returns or to provide information to back an aid request, estimates have been produced that are neither needed by local policy-makers or analysts nor of defensible quality professionally. (p. 13)
The value of statistics is judged by their usefulness in social and economic development and policy formulation. In Africa, however, their value is questionable, because they are subject to omissions and misreporting. (p. 15)
Given the incomplete, fragmentary and defective nature of the data available, their interpretation must remain somewhat tentative, and an uncritical acceptance of a single set of data may be very misleading. (p. 15)

Table 2.4.2 Technical & political problems in national data of African countries (Extracted from Kpedekpo and Arya, 1981, pp11-15)

Title of Table	Rows	Columns	Source
7.1 Crop Production in Ethiopia: Provincial Evaluations	14 regions (Wollo, Arussi.....)	Number of districts reporting, Normal, Above normal, Below Normal, Net below normal, Substantially below normal	Ethiopian Ministry of Agriculture (1973) Hussein (1976)
7.2 1972-3 Crop production in Ethiopia: Crop evaluations	Crop (Barley, TEff, Sorghum, Maize, Wheat, Others)	Above normal, Below Normal	Ethiopian Ministry of Agriculture (1973) Hussein (1976)
7.3 Food availability in Ethiopia: Calories per head, 1961-74	Period	Calories, 1973, 1974	FAO Production Yearbook
7.4 Whole sale Prices of Food Crops in Dessie, Wollo Province: 1970-3	Food crop (White wheat, Milling wheat, White sorghum....)	1970, 1971, 1972, 1973, Percentage excess of 1973 price over 1970-2 average	National Bank of Ethiopia (1970, 71) Ethiopian Grain Agency (1972, 73)
7.5 Subregional Variation of Relief Seeking in Wollo	12 Subregion (Raya and Kobo, Yeju, ...)	Population (thousands), Household numbers from the subregion in the relief camps, Number in relief camp per thousand from the subregion, relative distribution index	Betele et al. (1977)
7.6 Animal-Grain Exchange Rates in Different Strata in Harerghe	Prices (Sorghum, Maize, Cattle....), Exchange Rates (Index of Sorghum-Cattle, Maize-Cattle, Sorghum-sheep....)	Southern Ogaden stratum, Northern Ogaden, Issa, Harerghe, Normal, 1973, 1974	Seaman, Holt and Rivers (1974)
7.7 Grain Entitlement Loss due to Animal Loss and Exchange Rate Change	-- parameters were calculated from Table 7.6 --	-- parameters were calculated from Table 7.6 --	-- parameters were calculated from Table 7.6 --
8.1 Net Food Output per Head	Chad, Mali, Mauritania...	1961-5, 1968, 1969, 1970, 1971.....	FAO Production Yearbook (1976)
8.2 Calorie Consumption per head in Sahel countries	Chad, Mali, Mauritania... Food and Groundnut of	1961-5, 1972, 1973, 1974.....	FAO Production Yearbook (1976)
8.3 Food Output Compared with Output of Groundnuts in shell	Senegal, Niger, Mali, Chad	1966-8, 1969, 1970, 1971, 1972, 1973, 1974	FAO Production Yearbook (1976)

Table 2.4.3 Variables used by Sen in the chapter 7 & 8 of 'Famines and Poverty' (Compiled from Sen, 1981 Chapter 7 & 8))

> The government statistical documents are rarely sufficient, but much additional information can usually be obtained from the documents published by the various international organisations. (p. 3)
>
> • UN: The information given is a summary of statistics by the various governments, which is collected yearly. (pp. 3 - 4)

Both of the African case studies in *Famines and Poverty* (Sen, 1981) use the FAO production yearbooks: Its 1971 and 76 issues in the Ethiopian case study; and, 1976 issue in the Sahelian case study. Both 1971 and 76 issues of FAO production yearbooks do not indicate the source for each figure, but some of their data sets are associated with annotations that figures are a result of aggregation of existing data or preceding censuses. It is, therefore, reasonable to assume that the second quotation above, in this case, does not imply that direct data collections from local communities were carried out by FAO. In other words, the data used by Sen (1981) from the issues of FAO yearbook are essentially 'a summary of statistics by the various governments, which is collected yearly (Kpedekpo and Arya, 1981, pp3-4)'. This means that nature of data from the FAO production yearbook used in the African case studies is very likely to be similar to that of governmental data. Kpedekpo and Arya (1981) further explain both technical and political problems in such national data of African countries as shown in table 2.4.2. It is hard to confirm whether or not the data that Sen used in the African case studies had been affected by those technical difficulties and political pressures. It is, however, possible to investigate further. The variables in Sen's tables can be examined with appropriate caution regarding the nature of African data. The variables are summarised in table 2.4.3.

Four tables from the Seventh Chapter will be looked at here as examples. The variables of Table 7.1 and 7.2 correspond to a remark of Kpedekpo and Arya (1981) on Ethiopian agricultural statistics.

> In Ethiopia, direct information is usually used for making estimates of the total production of cereals. This direct information on production is obtained through crop-reporters. (p.164)

The relative variables such as normal, below normal or above normal, on Table 7.1 and 7.2 indicate a high probability of the existence of such 'crop-reporters' in some form in the field. Table 7.1 indicates 'number of districts reporting' from each region, and the total number of reports is 360 (Sen, 1981, p 91). Careful attention has to be paid to subjectivity of the 'crop-reporters': Were there specified concepts and definitions for them?; did they share such uniform concepts and definitions?; what referential state did they use as "normal"?; Can such a "normal" state be sufficiently specified for 360 reports from 14 regions of the country as Table 7.1 shows, and for 6 crop types as 7.2 shows?

Table 7.3 seems to neglect even more fundamental technical concerns. There could be three ways to derive the variable, calorie consumption per head: 1) survey for the whole population; 2) estimation from samples; and 3) estimation from division of amount of available food in calories by population. The first option is obviously unrealistic. Sampling method in the second option would never be incontrovertible especially when such an estimation is to be made sequentially. The third option may look feasible, and perhaps is the procedure used, but its outcome is unlikely to be accurate. In order to know the amount of available food for the population, it is necessary to know the amount of agricultural food production, which is not an easy task in Africa at a national scale. What Koley (1973) observed in Tanzania has a relevance here.

> It may be stressed here that yield figures are in most cases subjective estimates without specifying yield for mixed croppings and hence are subject to considerable margins of error. Hence, statistics derived from these acreage figures treated with caution.
>
> (Adopted from Kpedekpo, G.M.C. and Arya, P.L., 1981, p167)

Although this observation is not about Ethiopia, the fact that a dependable land use data set has not been generated for any country in Africa even by the end of the twentieth century suggests that yield figures for Ethiopia in 1970s are, like those for Tanzania, prone to the possibility of errors. Conversion of the amount of available food into calorie availability could be also problematic. Quality of even one type of crop is likely to differ from one place to another, and the co-efficient for the conversion cannot be uniform over the country. Population data based on census cannot be free from the possibility of error either. Kpedekpo and Arya (1981) summarises such errors.

> The accuracy of census information has varied from time to time and from place to place all over the world, but some generalisations are possible about types of errors found in censuses in Africa. Two main types of error are common: errors of coverage (underenumeration or overenumeration) and errors of content. In coverage errors, villages, hamlets, households, persons and so on may be missed or not counted at all; this is known as undercount or underenumeration. If households, persons or villages are enumerated or counted more than once, a duplication or an overenumeration occurs... (p. 33)

> One main problem in population enumeration is how to record an individual, whether *de facto* (according to where he spent the night prior to the enumeration) or *de jure* (according to his usual place of residence). This problem is acute in Africa in view of frequent population movements. (p. 35)

This possibility of error in population census is likely to have an impact which cannot be ignored on such data of Ethiopia where a large number of herdsman live. With these uncertainties, is the estimation of calorie

consumption for 13 years time period shown as Table 7.3 trustworthy?

Table 7.5 can be also affected by the possibilities of errors. The source for the first, second and third columns of this table is credited as Betele et. al. (1973), the fourth and fifth columns were calculated from the preceding columns by Sen. Among the three columns based on Table II of Belete et. al.(1973, p15), reliability of the second column, population of the subregions, can be questionable. In their footnotes, Belete et al. (1973) make mentions of sources of data as:

> The numerical information in this section mainly derives from a report by the Central Statistical Office, Addis Ababa. (p. 15)

> The data presented in this paper could not have been collected without the dedicated collaboration of all members of the Ethiopian Nutrition Institute Field Teams. (p. 22)

Betele et al. (1973) do not explicitly indicate the sources of data for their Table II. Taking those footnotes into account, it is, however, reasonable to assume that its population data for each of the sub-region were from the Central Statistical Office of Ethiopia, and the Ethiopian Nutrition Institute Field Teams. Needless to say, the various possibilities of errors pointed out by Kpedekpo and Arya (1981), as mentioned earlier, apply to the population data for the sub-regions. The fourth and fifth column of Table 7.5 in Sen (1981) can be affected by the same possibilities as calculation of those involve the second column as an essential variable.

Implications

It is important to emphasize the following idea. The nature of available data determines the arena for hypothesis

creation. As stated at the beginning of this section, data 'ties up an idea with the material world'. A scientific idea has to be confirmed by available data. Consequently an argument featuring the most robust and neat usage of available data is considered the tangent to the "reality". The game of hypotheses creation, or the evolution of hypotheses, consists of competition by scientists to achieve a status for their tangent to the "reality". Sen's rationalisation in *Famines and Poverty* (1981) was so robust that it became the seed of later development of famine models. It must not be forgotten, however, that the robustness was still within the limit of the available data, and the same goes for the supplements and challenges to the entitlement approach. The applicability of Sen's approach (Ibid.) to famines in Africa would be inevitably contradictory: it can be hardly challenged as its rationalisation of the data is splendid, but at the same time it can be only a castle built on the thin air of the African data.

One might still argue that follow-up works would confirm or reject acceptability of the data used by Sen (1981). This view is rather superficial. It ignores the fundamental and paradoxical principle: acceptability of a data set can be confirmed or rejected only on the basis of a more comprehensive and solid data set. Such a "better" African data set at the national level does not exist even in the 1990s, and could never have existed in the 1970s. It is very meaningful to come back to the guide to famine early warning systems and food information systems (Buchanan-Smith et al., 1991 a and b) mentioned in Section 1 of this chapter. Throughout Volumes one and two, the authors frequently refer to studies mentioning the quality of data (ibid.). It is possible to see a self-perpetuation here: famine early warning systems or food information systems were not produced and run on the basis of the entitlement approach or any of its following works as the confirmed truth, rather they were produced and run to prove that the approach and its modifications they were based on were true. Thus the nature of available data determines the arena in which hypotheses stalk tails of their own.

Sampling and consequent interpolation seem to occupy a significant position in this context. Collection of detailed data from selected sites and succeeding inferences for the overall population may deepen the arena for

hypothesis creation set up by census type data. Deepening of the arena generates room to compose alternative arguments to an established tangent to the reality. It is noteworthy that challenges to Sen's entitlement approach such as the work by De Waal (1989) which mentioned in the first chapter and that of Keen (1994) became persuasive as their arguments were based on not just census type data but detailed data sampled from the field. Caution is, however, still required here: a data set compiled from such sampling and interpolation cannot be a substitute for census data. Reliability of inference for a large area essentially depends on temporal frequency and spatial density of sampling. Carefully designed and implemented sampling scheme may marginally extend the arena for hypotheses creation, but compilation of those cannot become "better" census data. In other words, sampling and consequent interpretation may contribute to the formulation of objections against established networks of consensus. Foucauldian power, but not to establishment of a new regime of consensus.

The attempts made so far in this section is neither to sing the popular lament of scarcity of quality African data nor to discredit Sen's entitlement approach (Sen, 1981). Instead, they are to shed light on the paradoxical nature of African information studies. A social scientific assumption, even the one as persuasive as that of Sen (1981), for Africa can be rarely tied up with 'reality' very well because of the poor quality of available data. It will be, however, accepted as the current tangent to 'reality' by research communities, if the logic of the assumption is as solid as that of Sen (ibid.). Actual practices, implementation of early warning systems for example, result from the persuasive assumption as the absolute truth to be imposed on communities, societies and their environments. Research changes the objects studied by the researchers by inducing decisions, which induce further researches: the entitlement approach induced the alternative food information systems as explained in Section 2; then further researches on such information systems were induced. As noted earlier, hypotheses stalk their own tails. Sampling of data from the field further contributes to the self perpetuation. It is important to note that such a process originates from the very nature of science: it is neither "good" nor "bad" but academic. The gap between the arena for hypotheses creation determined by available data and 'reality' clearly needs attention in consideration of geographical information of Africa.

2.5 Interests of communities and prospects of interdisciplinarity

Interests of communities is an interesting issue in any consideration of African information. Two assumptions can be adopted immediately. One is that available information, interests and perceptions influence and even determine each other in communities. The second assumption is that there is a relationship between interactions among communities and the trinity of information, interests and perception: the former comes into existence as the latter exists; and moreover, the former influences the latter. These two assumptions lead to two precautions for observation of interests. One of those is that any individual community and any relationship among communities should not be treated as a static closed system. Rather it has to be treated as a dynamic process, in other words, an open system. The other is the identity of the observer. As explained in the previous chapter of this study, perception of an observer is a reflection of the location of the observer in the particular domain to a very large extent. The writer of this study belongs to the research communities, and therefore it has to be remembered that interests of research and non-research communities observed by the writer of this study only reflects his position in relation to his own and other communities. This is, however, not necessarily a limitation. The provocative nature of interests of communities and their interweaving relationships observed in this section is, again as explained in the last section of the previous chapter, intended to be the first link in a chain of reaction for individuals to acquire their positions in relation to others.

A crucial issue related to the perception of communities is their interests. The three kinds of communities, local, research and decision making communities, have their own distinctive interests. A full inventory of those interests is impossible because of the intrinsic diversity, however, we can gain an insight into the labyrinth of interests and perception of the communities by looking at the following examples. In the discussion on varieties and new crops in his study of Dafur region of Sudan, Morton (1994, p118) wrote:

> ... There is, however, one overriding reason why a wide range [of varieties of crops] is important, which is that it allows the most flexible balance between two opposing risks: the risk of failure in a bad year and the risk of missing the rewards of a good one. For the same reasons, individual varieties have to be judged on their performance over a range of circumstances. It is no good seeking one variety that is 'best of class' in all respects. This is why the post-famine insistence on drought resistance is such a mistake. It focuses exclusively on the risk side of the risk-reward balance. Research on sorghum, for example, has concentrated on short-straw, short-season varieties which are best suited to marginal lands and drier years. This is a perfectly valid research aim but it urgently needs to be balanced by the development of varieties for better soils and wetter years.

A farmer's interest is in economic returns from crop production. He / she tries to stabilise, as well as maximise such economic returns. He / she perceives the 'two opposing risks' and the probability of specific "crop drought". Naturally, the farmer's interest can be preserved more effectively by having a wide range of crop varieties. The interest of researchers is, however, only concerned with one of the 'two opposing risks', namely 'the risk of failure in a bad year'. The author, Morton (Ibid.), thinks that it is because 'the researcher has a natural desire for a clear-cut conclusion'.

A question has to be raised at this point. In what context and for whom, was the 'natural desire for a clear-cut conclusion' natural? The 'desire' was, perhaps, an expression of academic reductionism. It is a tradition in research communities to make an attempt to derive an exact solution by dividing complex reality into simple pieces, therefore it was natural for the researchers concerned with drought to concentrate their efforts on development of drought-resistant varieties. With this view, an argument could be developed as follows:

1) Agronomic scientists' attention was focused on development of 'short-straw,

short-season' varieties as they perceived that 'the risk of failure in a bad year' was the sole issue;

2) Then, an observer with sufficient field experience pointed out the irrelevance of the agronomists' approach, and suggested the necessity of development of varieties for 'better soils and wetter years' to maintain the range of varieties available to farmers; and

3) In this way, the interest of the research communities as a whole can be guided towards the interest of local communities despite the over-simplification arising from the 'desire for clear-cut conclusion'.

The conclusion of this argument would be an advocacy of interdisciplinary approach. This is probably the view accepted by the today's research communities as their consensus: collaboration between different disciplines should be encouraged; and diverse academic interests possessed by individual researchers could result in a synergistic outcome. As a matter of fact, a great number of researchers from various academic backgrounds are trying to make their perception relevant to complex reality through close collaborations. This may seem sensible, however, it may be rather superficial to try to understand perception of the research communities on the basis of their academic interests alone. It has to be noticed that there is no reason to assume that research communities are totally immune from perception and interests of decision making communities. It has to be remembered that academies have often served political interests in human history. Perception and interests of the research communities need to be considered in relation to those of the decision making communities, and therefore will be looked at again after analysis on the decision making communities.

The perceptions and interests of the decision making communities in the international arena are largely related to public pressure. Helpless images of "drought" and consequent famine, and impressions of incompetent governments in Africa are well promoted in the developed world. Burnell (1991) mentioned a British domestic political issue associated with the Ethiopian famine in 1984 -5:

> ...On that occasion publicly expressed dissatisfaction with the government's handling of the issue did register with the politicians. Not only did it bring about a modest concession to the aid budget an extra £47 million spread over two years) by the Chancellor of the Exchequer, but it was probably responsible for the Prime Minister's decision to replace Timothy Raison as Minister by a fresh face. In addition to the political campaigning by NGOs such as the World Development Movement ('a highly professional insider's lobby' according to the political scientist Steven Arnold), the Band Aid / Live Aid initiative for Ethiopia led by the pop singer (Sir) Bob Geldof was enormously successful at raising funds.

This distant political impact of an African 'drought' echoes an observation of Drèze and Sen (1989, p69) on 'self-congratulatory snippets' of a non-governmental organisation at the drought in Maharashtra in India in 1972 - 3.

> ... One of the relief organizations — indeed one that has altogether distinguished itself for many years by its far-sighted initiatives and actions — had no hesitation in reporting in its bulletin how a poor peasant sighed that the drought 'may be too big a problem for God; but perhaps OXFAM can do something'.

The interest of these decision making communities, governments and NGOs, is visible. They can increase political influence, and maintain economic foundation, by impressing their supporters. It is an political art: it is supremely important for governments and NGOs to look able to handle the 'problem' by making decisions in front of the public, but not necessarily to define, or perceive, what precisely the 'problem' is. One might try to justify the interest of the decision making communities as a tool to actualise humanistic motivation possessed

by their staff. This viewpoint is either naive or pointless. Although the individuals in the communities may possess some "good will", their organisations follow a different logic. Or, the individuals' ideologies, linked to the sense of value of the public, legitimate their communities to keep existing and to expand. In other words, ideologies of individuals and self-interest of decision making communities can 'go side by side (Burnell, 1991)' in the decision making communities.

Bearing the circumstances of the decision making communities in mind, it is interesting to reconsider perception and interest of research communities again. The following quotation may be an useful starting point.

> When he was Minister for Overseas Development Patten argued repeatedly that the best way to advocate an increase of the aid programme in the long term was to demonstrate its high quality. In the first instance he was probably thinking about how to gain support for the ODA in the Cabinet and in the corridors of power generally. In turn this involves the belief that a positive estimation of the ODA's work by the man and woman in the street, and in particular by what might be called the attentive public — interested academics, consultants, journalists, charitable development agencies, pressure groups and other opinion-formers — would be helpful to the cause. (Burnell, 1991)

Decision making communities need to, and try to, play the role of the Saviour with academic legitimacy and scientific competence in response to public pressure, as well as, in favour of their own interest. What research communities are expected to provide is quality assurance concerning decisions made by governments and other organisations. An interesting questions can be raised. What can be the frame of reference to determine such "quality"? At this point, the diverse academic interests held by the research communities contribute to the interests of the decision making communities by not being able to give any definitive answer. The research communities do not offer one frame, but instead, exhibit a number of possible frames. Moreover, the range of

frames for quality assurance and assessment are continuously being renewed, as academic paradigms change. The decision making communities are able to choose favourable frames for their interests, and to switch one frame to a more fashionable one from time to time. Using academically produced frames as consumables, it is permanently possible for them to argue that their decision is of high quality as its direction is approved by "leading researchers". For example, using the issue of the crop varieties mentioned earlier, a decision making community can employ the biological scientists' notion, the necessity of varieties which are suitable to marginal lands and dry years, as the basis for their decision to encourage researches on development of such varieties by funding. The science supported by the decision making communities justifies and maintains their demand for economic resource and political power. If the researches produce any successful result, it is to be widely announced. If it does not, the decision making communities can switch to another academic notion, such as the "urgent" need to maintain the range of varieties available to farmers, which is pointed out by an "experienced field observer". If the switching is successful, it is to be promoted. If it is not, a new approach is to be found and adopted. Whatever the outcome is, the "quality" of decisions is "high". The economic resource circulates, the interests of the decision making communities is maintained, and the structure reproduces itself through the process. In this circumstance, it is hard to assume that perception of the research communities is based on academic interests alone, or unrelated to non-academic interests such as funding opportunities. Those two kinds of interests are, explicitly or implicitly, coupled in perception of the research communities.

One might argue that if some sort of coherence comes into existence among diverse academic interests of the research communities through interdisciplinary efforts, then a solid frame for quality assessment and assurance could be imposed on the perceptions and interests of the decision making communities. Some of recent literature emphasises the necessity and bright possibilities of interdisciplinarity. For example, O'Riordan (1995) wrote:

> ...Interdisciplinarity means taking a more negotiated science into the policy realm and

> engaging with the public. This is because societal understanding is vital to the conduct of science under conditions of great uncertainty, value conflict and data ambiguity.
>
> (p 2)

> ...Interdisciplinarity is not just a matter of integration. It is the basis for a fresh way of identifying, defining, interpreting, analysing and solving environmental problems. It involves not just the academic researcher, but also a creative relationship between those who have to act and be responsible for their deeds, and those who prepare the evidence and offer advice on the basis of various methods of enquiry.
>
> (p4)

The point which has to be examined is whether or not the concept of interdisciplinarity can be something more than another academic product only serving the interests of the decision making communities. Two points should be noticed. The first point is that interdisciplinarity is not a simple academic frame but a meta-frame to produce possibly "fresh" frames. This is its strength as well as its weakness. Interdisciplinarity is a persuasive paradigm attractive for adoption by the decision making communities, however, its implementation can never be easy. The harvest of interdisciplinary efforts cannot be immediate, as there is no readily available standard format and circuit for close collaboration among the established disciplines of the research communities. This may be taken as a matter of course, however, it has to be emphasised that there is a possibility that the originally intended effect can be lost in the time-consuming process. Interdisciplinary efforts would essentially consist of endless trial and error. This means that ambiguity and uncertainty would be the perpetual attribute of such efforts. It is extremely doubtful if there is any systematic and clear criterion to separate the scientific ambiguity from the 'fresh way of identifying, defining, interpreting, analysing and solving environmental problems (ibid.)'. The long process, combined with the perfectly justifiable objective and such scientific ambiguity, would definitely induce political interest but not necessarily consistent political response. The other point to be

noticed is the paradox of interdisciplinarity: its intended effect is actual restructuring of the relationships between all the communities, in a way which is inter-communal but not just interdisciplinary. Synergy of disciplines is a matter for the research communities, and synergy of the perceptions of the communities is a matter for all the communities. Expansion of the former to the latter would require not only close collaboration among academic disciplines within the research communities but long-term hard efforts by all the communities to adjust their perception and interests. This is easy to hope for, but too complex intentionally to actualise. As it has been seen in the third section of this chapter, the amount of information required to understand aspects of the communities brings about the two questions. Who is capable of acquiring, processing and synthesising such information? More importantly, who can be responsible for the administration of such information? The concept of interdisciplinarity does not seem to be sufficiently defined to answer these questions, and the objective of the concept cannot be fulfilled without finding such answers. Thus although it is a sensible idea, interdisciplinarity is difficult to implement effectively, and there is a considerable possibility that it could become yet another academic consumable to maintain the existing relationships among the communities.

Implications

The primary objective of any individual in the three types of communities, local, research and decision making, is not the regeneration of the ever unchanging structure. As Burnell (1991) notes, ideology and self-interest go side by side. Various forms of "official" and explicit principles are the primary objectives of research communities and decision making communities. They also have various forms of self-interests as the silent objectives. These two types of objectives support each other, and form networks of consensus which keep driving the mechanism. The term of Fergusson (1990, pp254 - 255), *anti-politics machine*, refers to this driving force. The *anti-politics machine* is the social mechanism, "development" in the case of Lethoto studied by Fergusson (ibid.), run by the scenario, or the strategy, not written by any individual or a group of people. Power

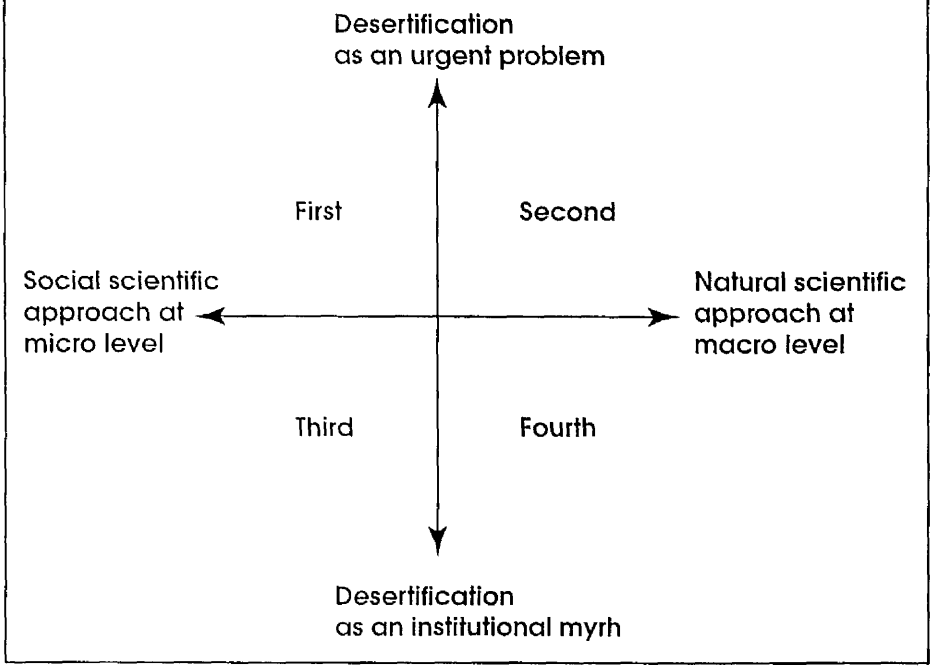
conceptualised by Foucault is very relevant here: the *anti-politics machine* does not follow any human logic but its own organisational or institutional logic.

The perceptions and interests of the research and the decision making communities vitalise the *anti-politics machine*. Governments, international organisations and researchers are parts of the structure which maintains its status-quo at a meta-level by looking at aspects of environmental and socio-economic phenomena, by employing academic frames, and by making decisions and actions. Each part of the structure may produce a sensible strategy, but the structure as a whole is driven by the unchanging *authorless strategy* (Ferguson, 1990, p20). Any individual effort to change, or to "improve", the structure only results in contributing to the regeneration of the underlying structure in the end. Awareness of this process makes one point clear. The socio-political structure stands on the absence of a common and precise perception of "drought". This absence is the pivot from which the anti-politics machine generates its continuity. The absence has an infinite duration: it is impossible to exhaust the absence. In other words, the absence of consensus is a permanent structural element in the anti-politics machine vis à vis drought. The research and decision making communities are able to take advantage of this element for their continued existence. However, the two entities, local communities and their environments, are not able to do the same. This is precisely the problem of the *anti-politics machine* structure. It should be emphasised that the 'permanent absence of consensus' is further "fortified" by the "schism" of Foucauldian power pointed out in the third section of this chapter, as well as, by the size of the arena for hypothesis creation determined by available information explained in the fourth section.

2.6 Desertification, its function as an issue: underlying 'dynamic immobility' and the absence of a local voice

Desertification is dualistic in at least two ways. First, it is said to be one of key environmental and socio-economic issues of not just Africa but the world, but on the other hand, it is considered an 'institutional myth'

Figure 2.6.1
Four Quadrants of Desertification Research



(e.g. Thomas and Middleton, 1994). Secondly, on one hand, ecological and climatological discussions at macro level are enthusiastically made, but on the other hand, necessity of the "grass-roots" or the "bottom-up" approach to social conditions at micro level is emphasised (e.g. Danish, 1995). These two sets of binary oppositions can be two axes to form a two dimensional space of debates for desertification as shown in figure 2.6.1. Most of existing statements about desertification would fall in one of the quadrants along the two axes. For example, the second quadrant would accommodate the kind of study which does not doubt the significance of desertification as an "urgent global problem" and employ advanced earth observation technology to exhibit its "increasing danger". In this section, as a drill, each of the two axes and the quadrants shall be observed with reference to the four implications identified in the second to the fifth sections of this chapter. It may be possible to introduce other axes to the space of debates for desertification, but the two axes would be adequate for the purpose of this section.

Whether it is an "urgent global problem" or an "institutional myth", desertification is an issue. In other words,

desertification generates, and demands, *discourses* functioning as truths. Equivalence of this in the relationship between famine models and famine early warning systems was looked at in the second section of this chapter. One who talks about desertification automatically takes a part in the autonomous process of desertification hypotheses creation. A hypothesis focusing on desertification, which is likely to have a position in the figure above, starts playing the role of 'truth' by which practices are guided in societies. If the hypothesis is in the first or second quadrant, then the natural outcome would be actions such as an amelioration plan for desertification at micro level or an monitoring programme at macro level. If the hypothesis is in the third or fourth quadrant, then the outcome would be absence of actions or a proposal to re-consider and to re-examine desertification as an issue. It is possible to see schism of Foucauldian power here. Similarly to the case of drought which was looked at in the third section of this chapter, integration of the first and second quadrant is easy to dream, but would be tremendously difficult to implement. Orone (1995) writes:

> Local people, in response to the inequalities of development and continuing poverty, develop approaches to cope with negative situations. These coping mechanisms can include swamp reclamation, and cutting trees either to make charcoal or produce firewood for sale. To the local people, these actions are not seen as degrading the environment or causing desertification. Instead, the sources of degradation are desertification and poverty.
>
> Several reasons can be advanced to explain the local perception. The most important of these, however, have to do with differences in the way local people and outsiders (intellectuals) conceptualize issues like desertification. Clearly, the "cause and effect" reasoning which has been characteristic of antidesertification studies, policy and programs is at odds with the reality at the "grassroots." This understanding also differs because the intellectual (scientist) has an understanding and conceptualization of macro-

> level, global issues, while the local person has an understanding based on issues limited to the local surroundings, and over prolonged periods of time.

The gap between synoptic information possessed by research communities (i.e. the intellectual, scientist in the above quotation) and local circumstance is not simply a technical issue but an issue reflecting the structure of the contemporary world.

The contrast between the second and fourth quadrant is crucial in the context of the arena for hypothesis creation. Like the data Sen used in the African case studies in *Famine and Poverty* (1981) which were looked at in the fourth section of this chapter, data which are supposed to tie up desertification as an emergent problem with societies and their environments are controversial. The famous image of advancing desert is probably a good example as Thomas and Middleton (1994, pp60 - 61) reports. Lamprey (1975) used a survey and aerial reconnaissance in Sudan, and outlined the edge of vegetation. This line was compared with the boundary drawn in 1958 by Harrison and Jackson (1958) as a part of Sudanese vegetation survey. The result was that the edge of the desert seemed to have pushed out vegetation from a 90 to 100 km strip in the 17 years. The desert seemed to be encroaching at the speed of 5.5 km per year. In 1984, Helldon (1984) examined the same study area and the material that Lamprey (1975) used. He found that the boundary drawn in 1958 was not from an actual survey but the 75 mm isohyet. Helldon (1984) also compared archived remotely sensed data sets of the study area for 1972 and 1979, and detected no advancement of the desert between the two dates. The processed satellite imagery showed the desert-vegetation boundary in the approximately same position as Lamprey's survey indicated. This example might be an outdated episode, as desertification is now considered land degradation in arid and semi-arid areas rather than the "advancement of deserts". A shift of desertification *discourse* must have taken a place. The old story still has, however, relevance today. It is necessary to pay attention to the fundamental principle mentioned in the fourth section of this chapter: data ties up an idea with the material world. Even today, there is still a very long way to go before a sufficiently firm arena for the creation of a

desertification hypothesis can be established. Remotely sensed data with high spatial, spectral and temporal resolution are becoming available but archiving of those for a long period, say 50 years, is necessary for significant sequential analysis. Field checking for verification of such remotely sensed data adds another difficulty especially in Africa. Moreover, the acquisition and refinement of socio-economic data for a large proportion of Africa are not feasible. Integration of natural scientific data and socio-economic statistics in an operational manner is out of the question. The current arena for the creation of desertification hypotheses involves a large proportion of subjective guesses labelled as "estimates", and is elastic. The data currently available for the creation of desertification hypotheses are not tied up with societies and environments. It solely functions as a tool of institutional expediency. In this context, desertification is an institutional myth. A desertification researcher without the notion for the vertical axis of figure 2.6.1 is a naive scientific victim of the elastic arena for desertification hypotheses creation, and a desertification practitioner who intentionally ignores the very existence of the axis is a political exploiter of the reality of institutional expediency.

Interests of communities in the issue of desertification can be well observed if relationships of communities with the quadrants of figure 2.6.1 are examined. Let us look at the interests of local, research and decision making communities with references to the figure. First, it should be noted that local communities are detached from any of the quadrants. The two axes of the figure exist only in scientific and political debates over desertification as an issue. One may argue that the local communities is related to the first and third quadrant. That is true indeed, but it has to be noted that their possible presence in those quadrants are via the interests of the research communities. It is interesting that while the voices of local communities on famine, drought or poverty surely exist, direct comments from local people in Africa on desertification are absent. A theoretical explanation for this would go like this:

1) Desertification is the cause and result of famine, drought or poverty, and local people are facing only those direct problems; and therefore,

2) Only people (i.e. scientists and decision makers) who are in the position to see

the whole picture can perceive desertification as a hidden but urgent problem.

This explanation can be controversial. It can be counterargued with evidence that local communities have "indigenous" scientific approaches to their environments at micro level. Such approaches are, as quoted earlier, 'limited to the local surroundings (Orone, 1995)', but they have occurred 'over prolonged periods of time (Ibid.)'. Whatever the definition is, and whether it is a myth or a fact, desertification as a physical phenomenon refers to a physical process in an geographical tract. The term process relates to time. There is no reason to assume that the ability possessed by research and decision making communities to monitor geographical tracts at one moment or a few occasions with intervals is the sole tool to perceive the process. Moreover, the validity of this ability is questionable as discussed earlier. Instead of the "theoretical" explanation, a more careful analysis could be made if the function of the absence is considered. The absence of local voices on desertification might function in a similar fashion to the way that the absence of the common and precise perception of drought did in the fifth section. The issue of the absence of the common perception will be examined later in relation to the interests of the other communities.

Secondly, works carried out by research communities are distributed in the first, second and third quadrants. It is noteworthy that a short excursion to a library, or a browsing of on-line digital archives, reveals a scarcity of studies in the third quadrant. This distribution pattern is perhaps a result of the history of the desertification discourse. In other words, it is probably because of, the interactions between and interactions of, academic interests of research communities and political interests of decision making communities. Desertification as a "scientific" issue started from the second quadrant of figure 2.6.1, then it expanded towards the first quadrant relatively recently. Meanwhile the fourth quadrant emerged as criticism towards the second quadrant. The "scientific" data showing the extent and status of the "desertification hazard" presented by UN organisations such as UNCOD (e.g. UN, 1977) or UNEP (e.g. Mabbutt, 1985) since the 1970s provide good evidence for the assumption that the second quadrant was the original breeding ground for desertification as a "scientific" issue. Before those presentations, desertification was not an urgent global problem. The expansion of the second to the

first quadrant could be well explained by the observation made by Thomas and Middleton (1995, p64):

> In the 1980s, desertification became a catchword which had to be included in all good project proposals for dryland development aid.

The delivery of development aid naturally involves socio-economic factors, and the study of desertification at micro-level started in response to the problems encountered in delivering such assistance. In a sense, desertification as a scientific issue ripened, or swelled, in the second quadrant, stimulating substantial funding flows making the issue go over the vertical axis. During this process, re-examination of studies in the second quadrant such as that of Helledon (1984) over that of Lamprey (1975) mentioned earlier were carried out, and the fourth quadrant was established. Presumably the scarcity of studies in the third quadrant is because its foundations, the first and fourth quadrants, are still relatively new. It is, however, reasonable to assume that a significant number of studies in the third quadrant will come into existence sooner or later. We are likely to see the reverse of the process which has already occurred: works in the second quadrant have resulted in generation of works in the first quadrant as the extension, and works in the fourth quadrant as its revision; and, revision of the first quadrant and extension of the fourth quadrant will emerge as activity in the third quadrant.

What have research and decision making communities gained from the evolution of the discourse, and what will they gain in future? Moreover, what have local communities gained, and what will they gain, in relation to interests of the other two communities? Research communities have gained research opportunities. It may be possible to say that a new market for academic consumables was created. It should be noted that the fulfilment of academic interests in desertification studies requires substantial research funding. Decision making communities, UN organisations especially in the case of desertification (Thomas and Middleton, 1995), have gained the initiatives to "combat" desertification through the promotion of "awareness for desertification as an emergent problem" leading to desertification oriented aid and research projects.

What have local communities gained? Perhaps, only a number of successful and unsuccessful development aid projects which will be remembered as achievements by research and decision making communities. Just as famine victims die or live under alien definitions (De Waal, 1989, p30) as discussed in the first chapter, the relevance of those aid projects to interests of local communities in the arid and semi-arid parts of Africa is purely by chance, and the permanence of the effectiveness of such assistance at points where they occurred cannot be guaranteed either.

Will the scepticism presented by the works in the fourth quadrant of figure 2.6.1 and possibly those in the third quadrant in future change the composition of knowledge? It does not look a very likely development in the case of desertification discourse. Whether desertification is an institutional myth or not, land degradation in arid and semi-arid regions in Africa is a fact. The elasticity of the arena for desertification hypotheses allows the issue of desertification to adapt to this fact, just as definitions of famine 'describe situations that have already been defined as famines (De Waal, 1986, p1)'. Outcomes of efforts in the fourth quadrant would be a revision of administrative and political aspects of the desertification industry and suggestion for more scientifically sound observation of land degradation labelled as desertification in those regions in Africa. These outcomes may change the possessor of the initiative of anti-desertification actions, from UN organisations to smaller NGOs for example, and may discourage opportunistic uses of science. Desertification, then, survives as an important issue, but the interests of the three communities will be unchanged. Thus the structure of information portico will reproduce itself through the process around the absence of local voice on desertification. The characteristic of the structure can be expressed as dynamic immobility: dynamic changes keep taking place on the surface of the structure but the underlying composition never changes. It is possible to say that even an analysis like the one made in this section would contribute to the dynamic immobility of the structure at the end. It is a stalemate.

Chapter 3 Propaganda and its Baudrillardian Destination

3.1 Introduction

Just as scientific hypotheses function as academic consumables for decision making communities, news and reports from the mass media function as humanitarian consumables for the public. Processes of discourse evolution sustain the dynamic immobility of the Foucauldian structure as observed in the previous chapter, and operations of mass media conform to the same idea. Chomsky and Herman (1994) illustrates the manufacturers of such humanitarian consumables as follows.

> The mass media serve as a system for communicating messages and symbols to the general populace. It is their function to amuse, entertain, and inform, and to inculcate individuals with the values, beliefs, and codes of behavior that will integrate them into the institutional structures of the larger society. In a world of concentrated wealth and major conflicts of class interest, to fulfill this role requires systematic propaganda. (p1)

> ...The raw material of news must pass through successive filters, leaving only the cleansed residue fit to print. They fix the premises of discourse and interpretation, and the definition of what is newsworthy in the first place, and they explain the basis and operation of what amounts to propaganda campaigns. (p2)

The objective of this chapter is to observe propaganda in and around Africa. There are three important points to comprehend. First, the importance of information contained in news and reports on TV and newspapers has to be understood. It is a topic as crucial as the 'political economy' of truth' in academic arena observed in the previous chapter. Types of information flows to be considered must not be confined to those in the domain of academic discourse evolution. Audiences of TV programmes or readers of newspapers are more numerous than readers of specialised academic literature. The latter is often a subset of the former, and therefore, it is arguable

that members of research communities are also under direct influences of mass media to a great extent. Scientific literature originated from slow but, hopefully, careful academic efforts obviously have importance as seen in the previous chapter, but are only a small part of complex information flows in the contemporary world. The crucial feature of the "non-academic" information flows in comparison to the "academic" information flows is velocity in terms of both transmittance and multiplication. While scholarly texts are conceived, written and published for a relatively small number of readers in time scales of weeks to years, newspapers and TV programmes can go through the processes of production and presentation for much larger number of recipients in the order of hours.

Secondly, while such fast information flows are paths for operations of propaganda to contribute to the dynamic immobility of the Foucauldian structure, they also start creating potentials of informatic accidents. Massive and fast flows of information inevitably contain contradictions. This paradoxical nature of the fast information flows may be comparable to the effects of automobiles. They contribute to societies as a fast and high-capacity mean of transport, but also induce potentials of traffic accidents. Without such accidentally exposed contradictions, the existence of propaganda is not evident and may not be recognised. Alleyne (1997) points out that 'one man's propaganda is another man's truth (p37)'. By reversing this epistemological theorem, it is possible to say that any stream of news and reports could become everyone's truths if there was no one suspecting the existence of propaganda. Accidental contradictions within information provided by mass media prevents such universal truths coming into existence. The detection of 'informatic traffic accidents', however, is not a spontaneous phenomenon. Just as beauty exists in the eyes of beholder, one has to watch sceptically the flows of news and reports on mass media to discover contradictions. Observation of propaganda in and around Africa needs to be based on such cautious observation.

Thirdly, although the recognition of propaganda through a careful examination of news and reports on TV and newspapers is useful to gain an insight into the state of information in and around Africa, to counter-attack

propaganda and the Foucauldian structure on the basis of such contradictions is another matter. Proliferation of information by mass media easily saturates the perceptions of the public, and the meanings of the disclosures about propaganda, disappear. The whole process becomes void of meaning, which is the cul-de-sac of the domain of Baudrillardian simulation mentioned in the first chapter of this study. To understand further what void of meaning is, it is useful to recall Baudrillard's comment (1987, p61) on Foucault's notion of power, a network of consensus, mentioned in the first chapter of this study.

> This universal fascination with power in its exercise and its theory is so intense because it is a fascination with a *dead* power characterized by a simultaneous "resurrection effect," in an obscene and parodic mode, of all the forms of power already seen — exactly like sex in pornography.

A similar phenomenon is the universal fascination with news of a disaster in Africa which can be so intense as to be like sex in pornography: pornography consists of signs of sex, taking forms in text or images, but does not include sex itself; sex is absent and only drifts in as the central 'illusion' in pornography; and thus pornography is only a predictable parody of previously existing pornography, a fairy tale in which the central meaning is lost. It is noteworthy that Benthal (1993, p179) comes up with the term 'disaster pornography' and characterises news of disasters as *folktales* (ibid, pp188-189) in his analysis of relationships between disaster relief and the media. The point to be noted here is that as disaster propaganda about Africa is destined to be "pornographic", even disclosures of propaganda cannot help being yet another variation of "pornography". Can a revelation of propaganda have any impact on saturated perceptions of the public and the ever unchanging Foucauldian mechanism behind them? This question will be considered later in this chapter.

With these three points as a precautionary context, the rest of this chapter takes a form of comparative study. More concretely, observations of two sets of news and reports are compared in the following sections: one of the two sets analyses news and reports of African events, especially of famine, and the other is those of the Persian Gulf War event. Inclusion of analyses of media coverage of the Persian Gulf War may look irrelevant in

a study focusing on geographical information in and around Africa, but it has an advantage. An exclusive observation of the behaviour of the mass media on "African" events would only lead to obvious conclusions such as calls for more "honest", "comprehensive" and "penetrating" reports to cover African disasters. Such suggestions would, even if taken seriously, lead to productions of "honest", "comprehensive" and "penetrating" parodies of existing folktales. Informatic aspects of the Persian Gulf War, however, which "took place" in 1990, have been analysed by a number of thinkers including Baudrillard and Kellner. Both analysis are both cited in the first chapter of this study. By applying what these thinkers learnt from news and reports of the Persian Gulf War to media coverage of Africa, it becomes possible to achieve a more insightful understanding of propaganda beyond the worn-out recommendations of more "honest", "comprehensive" and "penetrating" reports. In *The Persian Gulf TV War*, Kellner (1992) neatly reveals how mass-media served, or was used to serve, interests of the US military-industrial complex through the reporting of the war. The analyses of Kellner (ibid.) are important references on which to base a study of the media coverage of Africa as far as the first and second precautions explained above. Baudrillard (1995), on the other hand, points out parodic simulations in the War, the disappearance of meanings of information about the war leading to the disappearance of the war itself, and states that '[T]here is nothing to believe (p42)' in the three essays provocatively titled as 'The Gulf War will not take place', 'The Gulf War: is it really taking place?' and 'The Gulf War did not take place'. The considerations made by Baudrillard (ibid.) are good arguments to satisfy the third precaution explained above, namely the critical examination of the validity of disclosure of propaganda as a counter attack on the Foucauldian mechanism which orchestrates mass media. Operations of propaganda in and around African events are analysed by means of these concepts in the following sections of this chapter.

In this chapter, propaganda on the African event and those who manage it are observed. The observation indicates that the mass media cannot be a channel to make attempts to bring about a positive change for local communities. News and reports of events in Africa are destined to be a part of multi-faceted propaganda, and disclosures of such propaganda cannot be effective for its elimination because of proliferating information and

the 'saturation of perception'. Information on events in Africa conveyed to the public through the mass media are only agents prolonging the Foucauldian mechanism and only paths leading to void of meaning. This realisation has a very important implication for this study. The previous chapter examined how the regime of power / knowledge, the complicity of research and decision making communities, absorbs attempts to change circumstances. The discussion in Chapter 2 also showed how the Foucauldian mechanism reproduces itself through the process of the evolution of discourse. In other words, the impossibility of achieving change through academic efforts was identified. This chapter shows a similar impossibility. As far as African events are concerned, mass media is primarily a tool for decision making communities to orchestrate propaganda but not a channel for communication to serve the interests of local communities. Appropriate changes for local communities are, on one hand, blocked by the collusion between research and decision making communities in the Foucauldian sense, and, on the other hand, states of local communities are subjected to the different interests of decision making communities, the mass media and the public in the North in the Baudrillardian sense.

3.2 Propaganda at work

Kellner (1992) perceives that the Gulf War was 'primarily a media propaganda war (Kellner, 1992, p6)'. How can propaganda be related to discussions made in this study so far? He outlines what he means by using the term 'propaganda':

> By "propaganda" I mean discourse that is aimed at mobilising public opinion to support specific policies. (ibid, p6)

He, then, adds a note to this specific meaning of "propaganda":

> I am using the term "propaganda" in the sense of Laswell (1971), who uses it to describe the techniques used to manufacture consent to specific policies like war, and not in the more general sense of Ellul (1965), who uses it to describe the general climate of thought

and public opinion in technological societies. (Kellner, 1992, p11)

At this point, it is important to notice the distinctive characteristic of propaganda. It is the particular type of discourse which is 'used' for a specific purpose. Discourses such as "famine models" or definitions of drought, which were discussed in the previous chapter, are what autonomously evolve but are not techniques for a particular goal. Propaganda, on the other hand, deploys techniques to be intentionally used for the mobilisation of public opinion and the manufacturing of consents. A crucial question has to be asked here. What or who did use propaganda to manufacture consent in the Gulf War? One who rejects the Foucauldian view and perceives power as a commodity belonging to an individual or a group of individuals would see a kind of conspiracy behind the media propaganda war. It has to be admitted that Kellner (1992) might be misleading at this point . He writes:

> Concentrating more power in the hands of conservative and militarist social forces could spell the end of American democracy and an unending cycle of wars, military interventions, social squalor, and economic depression which will make Orwell's *1984* appear as a utopia. There is the clear and present danger that George Bush, Brent Scowcroft, Dick Cheney, Robert Gates, Dan Quayle, and other representatives of the military-industrial complex and National Security State will do anything — even undertaking a potentially catastrophic war — to further their interests. (Kellner, 1992, p428)

"Power" is localised in 'the hands of conservative and militarist social forces (ibid.)' in the first of the above two sentences, and the concrete names of people are mentioned in the second. Did those people use "propaganda" as the techniques to mobilise public opinion to support specific policies? Almost definitely they did, and some without the notion of Foucauldian mechanism would stop consideration at this point by accusing the people mentioned. Some with the notion of Foucauldian mechanism, on the other hand, would raise a further question: What did drive those people to manufacture a consensus among the public? Kellner (1992) attempts to answer this question. The people named, George Bush and so on, were 'representatives of the

military-industrial complex and National Security State (ibid.)'. Kellner writes about the militarisation of US society:

> The militarization of society has drastic implications for democracy in the United States. With the concentration of so many resources and power in the military sector, what Eisenhower called "the military-industrial complex" has come to control state priorities and to render social and cultural needs of secondary importance. Military spending tends to be highly undemocratic with large budgets for secret projects and, as Melman (1991) has argued, for decades only a small number of corporations benefit in a sector that produces few jobs or public goods. Moreover, the militarization of culture has meant that the military has come to dominate ever more realms of popular culture, ranging from movies, TV shows, video and computer games, and toys to trading cards. (Kellner, 1992, p422)

> The Gulf war dramatized the two main problems of U.S. society: militarism and excessive concentration of corporate, state, and media power. The same ruling interests came to control the state, the economy, and the media during the 1980s and 1990s with Ronald Reagan and George Bush pursuing policies that primarily benefited the corporate elite and the military-industrial complex, while the media were taken over by giant corporate conglomerates that tended to favor the Reagan and Bush administrations and military events which promoted the interests of the arms industries. (Kellner, 1992, pp422-423)

It has to be noted that the military-industrial complex that used "propaganda" is a substantial part of US society which was also the target of the "propaganda". The usage of "propaganda" was an operation, the execution of a technique, in and on the US social structure. If the US military-industrial complex during the Gulf War is anthropomorphised, it would have the face of George Bush or any of the people mentioned above by Kellner

(1992, p428). The "conspiracy theory" type consideration mentioned earlier is obviously naive because the US military-industrial complex would wear a different face depending on necessity. The face of the US military-industrial complex changes and therefore it is not significant, but the military-industrial complex itself and its mothering body, US society, do not change and deserve examination. In this sense, propaganda should be understood as a special type of discourse, and the Foucauldian perspective is useful in analyses of the use of propaganda.

In a paper written for the 8th Biennial Conference of the African Council for Communication Education (ACCE), "Communication and the Environment in Africa", McLean (1993) offers a viewpoint which is close to that of Kellner (1992) above. The paper (McLean, 1993) is provocatively titled as 'Population, communication and the environment: whose agenda?', and the author carries out a concise chronological analysis on political economy of a number of issues concerned with Africa. The discourse analysis made by McLean starts from the population research and family planning communication linked to socio-economic development in a single development model in the post-World War II era (1993, p 76). The approach set by the industrialised countries in the North was based on the idea that 'Africa's development must be stimulated from the outside, requiring a transfer and diffusion of available information and technology developed in the US and other industrialised societies (ibid.)'. Her analysis, then, moves on to the shifting of the agenda to "structural adjustment" in the early 1980s. The new development agenda encouraged a free market economy requiring reduction of African governments' social spending, selling off of public resources, offering of incentives to foreign investors and increase of exports (McLean, 1993, pp80-81). The background of the shifting of the agenda perceived by McLean is extremely insightful:

> Population growth (identified as the problem), family planning (identified as the solution) and the communication media (the mechanism used to keep the problem in the North and the solution in the South on the public's agenda) are interconnected through interlocking directorates into a web of class interests and promotion. Weissman (1972) suggests that

the same elites who have made the United States "the world's policeman have long been eager to serve as the world's prophylactic provisioner and they are grateful to academics for creating a new humanitarian justification for the old-age game of empire" (p43).

(McLean, 1993, p76)

Cloaked in the guise of humanitarian assistance, United States population organizations (initiated by members of the corporate and wealthy class) and supported by extra-regional researchers (funded by US government and the corporate elite) have been able to set the agenda for family planning and IEC [the Division of Information, Education and Communication of the US Agency for International Development] activities internationally, and thus in Africa, from the very beginning. To consider this conspiratorial is too simple an explanation. Essentially, the author has argued in this paper that the corporate elite are more concerned about their own class interests, promotion and survival and suggested that the US government and population organizations (by far the most dominant world-wide) have been able to create a climate in which African governments and its people are led to believe that the North is concerned about Africa's survival rather than their own. With the emphasis on population, the real culprits of Africa's environmental degradation — the arms manufacturing merchants, the militarization of culture, the economic choices made by the North and supported by a self-serving internal elite, — are allowed to go free. Thus, the population, communication and environmental agenda is set externally by government and non-governmental organizations through a complex network made up of strategic elites engaged in sustaining power.

(McLean, 1993, p83)

Clearly, what McLean tries to reveal is the Foucauldian mechanism behind the propaganda. Exactly like the

way the media propaganda functioned in the Gulf War, the media propaganda of population control conforms 'the old-age game of empire (Weissman, 1972, p43)' as quoted by McLean (1993, p76) above. The 'old game' is an example of 'dynamic immobility' at the world level. It is an interesting irony that the majority of the nine other papers of the proceedings (ed. Boafo, 1993) in which McLean (1993) is included as the 10th chapter focus on how to "promote" environmental awareness among African public, local communities. These efforts are based on the "self-evident" notion for the necessity of population control and of minimisation of environmental degradation in Africa. Are those authors generators of the propaganda? Rather they are a part of the propaganda: they animate, constantly regenerate, the propaganda by writing such articles and making efforts to improve strategies to promote the issues, but at the same time, they are targets of the propaganda in the sense that they are 'led to believe that the North is concerned about Africa's survival rather than their own (McLean, 1993, p83)' as well as to think that the necessity of population control and minimisation of environmental degradation is the absolute truth. One may persistently argue that, just as the Iraqi invasion of Kuwait "had to be stopped" in the Gulf War, population growth and environmental degradation "have to be stopped" in Africa, and therefore family planning and awareness for environment should be promoted among local communities. Such a viewpoint is irrelevant here. What urges contemplation is the structure and flows of information which induce such a view. It is important to realise that the sense of human welfare, or justice, which might be achieved by practising family planning in Africa, or attacking the Iraqi force in the Gulf War, is a matter of the sense of value at the individual level. It is naive to assume that such a human sense of value at the level of individual can be simply extended to the logic of institutions, industries, societies and governments. Rather organisations and communities follow a totally different logic taking the advantage of the individual sense of value. The issue of population, or the Gulf War, was created by nothing but the world structure which will keep producing problems and solutions to maintain its dynamic immobility. The 'actualisation of human good will' is the primary superficial defensive trick of the ever unchanging structure underlying, and its modus operandi media propaganda.

How does propaganda work? Propaganda has been placed in the Foucauldian context so far in this section. Now, attention needs to be directed towards concrete processes in which certain discourses can be shown to generate a consent among communities for a specific policy. Let us examine the operation of propaganda in the Gulf War as a model. Kellner (1992) thinks that the combination of the media pool system established by the disinformation policy of the US military and commercial interests of mainstream media was the gateway between the US military-industrial complex and the public to which the Gulf War propaganda was directed. At the level of journalist, the media pool system operated as follows:

> From the beginning of the U.S. deployment, the press was prohibited from having direct access to the troops. Journalists were instead organized by the military into pools that were taken to sites selected by the military itself, and then reporters were allowed only to interview troops with their military "minders" present.
>
> (Kellner, 1992, p80)

> Reporters without escort who ventured out on their own were detained or told to leave upon arrival at bases and some were even roughed up (see Fialka 1992). During the war, credentials were lifted if reporters broke the rules of the pool system; New York Times reporter Chris Hedges had his credentials temporarily lifted for interviewing Saudi shopkeepers fifty miles from the Kuwaiti border (Schanberg 1991). Reporters were not allowed to forward their material until it had been subjected to "security review," in other words, military censorship.
>
> (Kellner, 1992, p81)

The effect of this method was that a coherent image of the war was projected. It was essential to present a clean high-tech war in which justice in every sense was exclusively on the side of the US and its allies. There are a number of examples of the image intended. Photographs of corpses of soldiers (e.g. Kellner, 1992, p383) and, more especially, of civilian victims (e.g. Kellner, 1992, p292) were rarely exposed to the US public. Women of

the US were presented as a symbol of the conservative sense of value as well as of the liberal US society: 'Wives breaking into tears as their men marched stoically to war' as well as "women warriors" representing "progressive" US customs in the Gulf juxtaposed with Arab women in veils representing "backward" regimes (Kellner, 1992, pp74 - 76). Flight crews of US military, who carried out the first bombing of Baghdad, in TV interviews described the antiaircraft fire by the Iraqi force as "exactly like the movies (Kellner, 1992, p135)" without showing ambivalent feeling for the possibility that they might have killed civilians in the city.

The media pool system is a relatively new phenomenon in the history of US warfare. Kellner writes:

> Historically, journalists have been allowed direct access to combat troops and sites, and frontline reporting was distinguished during World War II and Vietnam (see Knightly 1975). The military organized the pool system, however, because they perceived that reporting had been too critical in Vietnam, and they blamed the press for helping erode public support for the war. Following the example of British censorship of the press during the Falkland Islands/Malvinas war, the United States controlled press access during the Grenada invasion and instituted the pool system during the Panama invasion. The pool system allowed the U.S. military to keep the press completely away from the battle action in Panama during the decisive first day of the invasion and to keep most of the press interned on a U.S. military base during the next days. Because the press was prevented from discerning the extent of civilian deaths and the destructiveness of the invasion, the military used this strategy of information management as the model employed during the Gulf War. (Kellner, 1992, p81)

What is behind the change of US military in treatment of the media? It is beyond the scope of this study to answer this question fully, but a hypothetical interpretation can be made to assist analysis of propaganda related to geographical information of Africa as follows. The above observation made by Kellner (ibid.) suggests three parties were involved in the development and establishment of the media pool system. They are:

1) The US military-industrial complex;

2) The press (i.e. mass media); and

3) The US public.

It is reasonable to assume that these three parties have been experiencing changes in their relationships in the 50 years from the World War II to the Gulf War. During this time period, the US military complex have been massively expanded and it has become a substantial part of the US society through a number of wars, military operations and the cold war. The mass media increased its capacities of acquisition and distribution of news thanks to technological developments and the expanded markets for information. The US public diversified its sense of value. In World War II, the three parties had a harmony. The "good" and "bad" were clear to the US public during the Second World War — the US military and its allies were the saviour of the free world fighting against the inhumane fascism of Germany, Italy and Japan, and reports of the war by the press satisfied both the military-industrial complex and the public. In other words, there was a firm consensus among the three parties. The Vietnam War, however, appeared as the point at which the three parties were set against each other. The US military-industrial complex needed complete support for the war to justify the mass consumption of material and human lives while the mass media needed to satisfy diversified senses of value held by individuals in societies of the US and beyond. Then, knowledge was gradually produced in the Foucauldian sense. Techniques of information control was somehow learnt from the outside, 'British censorship of the press during the Falkland Islands/Malvinas war(ibid.)'. The knowledge was tested in the Panama invasion and finally took the form of the media pool system at the Gulf War. In other words, consensus was made among the three parties.

In the hypothetical interpretation presented above, the interests of the mainstream media during the Gulf War is an interestingly ambivalent element. On one hand, the major TV networks had to satisfy their owners. The "Big Three" TV networks of US and are owned by or deeply connected to companies which are a major part of the US military-industrial complex: National Broadcasting Corporation (NBC) was owned by General Electric which had gained more than 15% of its 54.5 billion US dollars revenue from military contracts in 1989 (the

contribution of NBC was around 6%); the board of directors of American Broad Casting (ABC) was involved with oil companies such as Texaco and the defense industries; and, the board of Columbia Broad Casting (CBS) included directors from Honeywell and Rand Corp. which were also major military contractors (Kellner, 1992, pp59 - 60). National newspapers and magazines were also connected to such companies. For example, the board of *Washington Post* included board members of General Electric (ibid.). It was natural for the mainstream media to exaggerate the capacity and magnitude of the Iraqi military as the evil and "fourth most powerful" force in the world. On the other hand, however, the mainstream media had to please a massive number of audiences and readers who presumably had a wide range of senses of value. Just before and at the beginning of the war, the mainstream media had a double-sided attitude.

> On January 15 and 16, as the deadline for Iraq to leave Kuwait approached and passed, significant coverage of the antiwar movement appeared on television. Both national and local news prominently featured stories on candlelight vigils in which large groups of individuals prayed for peace...
>
> (Kellner, 1992, p251)

> On the first week end of the war, January 19-20, the big demonstrations in Washington, D.C., and San Francisco, in which around 100,000 people marched in opposition to Bush's war, were covered on TV. On Sunday, January 20, CBS's "Sunday Morning" program featured a sympathetic segment on opposition to the war in Durham, N.C., and the local stations in Austin, Texas, presented detailed coverage of the weekend's antiwar activity...
>
> (ibid.)

> On CNN, Ann McDermont narrated a segment on January 23 that showed that anti-war protests were more organized and diverse than in past wars. Pointing out the differences

between the protests in the earlier era were motivated by a feeling of deep alienation from the system, but the current demonstrations were often organized by people strongly integrated into the system. Many protesters had been involved in other issues and a diverse range groups and types of activities were visible, ranging from high school and college students organizing demonstrations, to lobbying efforts, involvement in peace campaigns, education efforts like teach-ins, and prayer vigils...

(Kellner, 1992, pp251-252)

On January 25, "CBS This Morning" had an excellent segment on organized local and national efforts to stop the war. Roger Newell representing the National Committee for Peace in the Middle East, stated that, "the American people want an end to the conflict," and he stressed that the goal of the movement was to bring the troops home safely...

(Kellner, 1992, p252)

Yet a FAIR "Gulf War Sources Survey" of television coverage of the war from January 17 - January 30, 1991, found that only 1.5 percent of the network TV sources were identified as U.S. antiwar protesters — about the same percentage of people asked to comment on how the war had affected their travel plans; only one leader of a peace organization was quoted in the broadcasts surveyed, while, by contrast, seven Super Bowl players were asked their opinions on the war; about half of the sources were connected to either U.S. or allied governments; and few intellectuals and professionals associated with the antiwar movement appeared while retired military personnel were most frequently used by the networks as "experts" (FAIR Press Release, Feb. 26, 1991)

(Kellner, 1992, p253)

> Nonetheless, throughout the country, anti war demonstrations continued to unfold, despite the media attacks and the more positive coverage of prowar demonstrations. Divisions in the country became less and less visible, however, for network television gave less and less coverage to opposition to the war, and one heard almost no antiwar voices in the mainstream media as the war went on. What little one saw of the antiwar demonstrations was reduced to quick images of crowds without any discourse and there was hardly anything on the growing European or Third World antiwar movements and demonstrations. One got a quick glance at 200,000 German antiwar demonstrators in Bonn; brief images of large demonstrators in Britain, Italy, and Spain; and snippets of images of hundreds of thousands of Arabs demonstrating in Algeria, Libya, Morocco, Jordan, and other Arab, Moslem, and Third World countries as well.
>
> (Kellner, 1992, p254)

The attenuation of TV coverage of the antiwar movements is clear from the above quotations. This process can be viewed as follows:

1) There was a wide range of the sense of value among the US public. It included a spectrum between antiwar and pro-war opinions;
2) The US military-industrial complex had interests in progressing the war and in public support for the war;
3) The mainstream media had contradictory interests. They needed to satisfy the two conflicting parties, their owners and the antiwar audiences;
4) By satisfying their owners' interests, the mainstream media was also able to satisfy the pro-war audiences; and
5) Reports of the war from the Persian Gulf were through the media pool system looked earlier, and specifically designed to satisfy the interests of the US military complex.

The third point explains the limited but factual TV coverage of the antiwar movements in US, and the fourth

and fifth points suggest the cause of the attenuation of such coverage. The mainstream media, however, employed a remarkable tactic to ameliorate the unsatisfied interests of the antiwar audiences: the war was presented as a "live" entertainment:

> The Gulf war was packaged as an aesthetic spectacle, with CNN utilizing powerful drum music to introduce their news segments, superimposing images of the U.S. flag over American troops, and employing up-beat martial music between breaks. The audiences was thus invited to participate in a dazzling war spectacle by its media presentation. (Kellner, 1992, p257)

Interviews of the flight crews mentioned earlier or the high-tech weapons such as "smart bombs" have also contributed to the image of the "live" and clean aesthetic spectacle. At this point, it is important to note that what was changed by the TV broadcasts was not just the image of the war but the role of the audiences. When people were engaged in antiwar, or even pro-war, activities, they were a group of individuals perceiving the connection between their daily lives and the distant Persian Gulf War. Their practices were based on certain discourses. In other words, they were audiences of TV programmes as well as actors in societies. The Gulf War, however, was transformed into a high-tech spectacle exactly like SFX films and sports events. The Persian Gulf was cut off from daily lives of individuals in the US. Discourses disappeared. Knowledge to oppose or justify the war was replaced by "live" information. The TV audiences now became "pure" audiences, spectators, of the media orchestration. Influencing spectators of the "live" event was as important as, or even more desirable than, reinforcing supporters of the war for the interests of the US military-industrial complex and its ally the mainstream media. At this very point, power as network of consensus became an illusion, and the media propaganda started transcending the Foucauldian domain.

Africa has not produced an informational event as explicit as the Persian Gulf War. Geographical information on Africa, however, is influenced by certain propaganda as McLean (1993) has demonstrated. In her analysis of media coverage of the Ethiopian famine in 1982, Fair (1992) writes:

> News is not merely a collection of facts put together in narrative form. It plays an important cultural role by providing audiences with ways of handling new and recurring issues and problems. To produce the news, media interpret the actions of people and events by selecting and emphasizing certain stories over others. Thus, the way in which the mass media cover Africa contributes to the public view's of the region.
> (Fair, 1992, p110)

> Generally, research on media coverage of Africa suggests that Africa, if not the least covered region of the world, is one of the most seldom covered. Of course, getting the story out of Africa is not easy. Reporters must contend with sources reluctant to speak for fear of their own safety, difficult travel conditions, censorship, inadequate communication facilities that make transmitting stories at times nearly impossible. And for media organizations to maintain a correspondent in Africa involves large financial commitments.
> (ibid.)

> But when the media do cover Africa, stories often conceive of Africa in a very narrow focus. Stories are largely event-based and crisis-oriented. Most commonly, media coverage is of an Africa enmeshed in a series of political and military imbroglios and ethnic violence. Moreover, relations between East and West — the Cold War framework — often inform this crisis coverage, as violence and conflict in Africa are seen as the site for struggle between superpowers. Thus, for African to be part of "all the news that's fit to print" as the motto of The New York Times says, it seems that news stories must include three elements: events, crisis, and superpower conflict. (Fair, 1992, pp110-111)

Two points can be noticed in comparison between the above quotation from Fair (1992) and discussions made

in this study so far. First, just as the arena for academic hypothesis creation is determined by available scientific data as explained in Section 4 of the previous chapter, so the arena for public perception is determined by news supplied by the mass media. Through academic hypothesis creation by research communities or news production by mass media, newly created pieces of information serve certain interests of certain communities. A subtle but important difference between these two processes is that while the evolution of academic hypotheses is the process in which autonomous competitions to win the status of the highest persuasion take place, an element of amusement has to be involved in the operation of the mass media. An academically persuasive hypothesis which would serve the dynamic immobility of the Foucauldian structure is chosen and used by governments or NGOs outside of the information producers, research communities, and becomes a discourse. A favourable news story to amuse audiences and readers is, however, produced within the information producers, the mass media complex, and presented as a packaged discourse. Secondly, the restraints of news acquisition from Africa resembles the media pool system during the Gulf War. For example, local 'censorship' in Africa corresponds to the prohibition of direct access to the troops in the media pool system, the 'difficult travel conditions' in Africa to control of travel of journalists in the Gulf, and 'inadequate communication facilities' in Africa to 'security review' of news material in the Gulf War. It is easy to dismiss this comparison as the restraints of news from Africa are conditions while the media pool system was an artificial operation. It is, however, still possible to think that those "African conditions" function as a kind of "media pool system". It is indeed reasonable to assume that just as the coherent public image of the Gulf war to satisfy interests of certain parties was primarily formulated by the media pool system, interests of certain communities are maintained by the limited arena of public perception determined by the raw "African conditions". The shadow of a natural tree could indicate time just as an artificial clock. It could be too superficial to dismiss comparison of the two because their mechanisms are both related to the larger, or deeper, structure, the geometry of the Sun and the Earth. With respect to the Gulf War and African famine, Kellner (1992), McLean (1993) and Fair (1992) all mention deeper structures, namely, the superpower(s) of the world; the military-industrial complex and US as the world's policeman in Kellner (1992), and 'the arm manufacturing merchants, the militarisation of culture,

the economic choices made by the North and supported by a self-serving internal elite' in McLean (1993, p83), and the Cold War framework at the time of the Ethiopian famine in Fair (1992).

With the notion for the above two points, media propaganda on "African" issues can be analysed further. The media pool system in the Gulf War and the difficulty of news acquisition from Africa are similar to the difficulties of environmental information capture in Africa looked at in Section 3 of the previous chapter. The media propaganda is, however, distinctively different from scientific information acquisition and consequent hypothesis creation. While what is brought about by research communities is the evolution of hypotheses, the mass media output provides variations of the same permanent, or primary, discourses. Fair (1992) identifies four primary discourses of food aid in a US major news paper, New York Times, at the time of Ethiopian famine. Discourse in mass media is defined by Fair (1992, p110) as 'certain rules and regularities that make up news content, creating or reproducing a structure of meaning '. This definition fits well to Kellner's definition of propaganda mentioned earlier, 'discourse that is aimed at mobilising public opinion to support specific policies (Kellner, 1992, p6)'. Combining the two definitions, propaganda is 'certain rules and regularities that make up news content, creating or reproducing a structure of meaning', 'that is aimed at mobilising public opinion to support specific policies'. Bearing this synthetic definition of propaganda in mind, let us look at the four primary discourses in the New York Times' coverage of the Ethiopian famine as identified by Fair (1992). They are:

1) The discourse of crisis

Report of urgency, emergency, catastrophe, and the prediction of death (Fair, 1992, p114). Common terms used in this type of discourse were *grim, agony of famine, fear of food crisis, food emergency, catastrophic shortage, scenes of horror, continent of misery*, and so on (ibid.). 'The food crisis in Africa was defined primarily by U.S. government officials, Westerners in international organizations, and Western relief groups operating in Africa (ibid.)', and quantitative prediction of death and

comparisons to the past famines were frequent (ibid.). In this type of discourse the "crisis" was explicitly linked to the larger world structure and moral value as the Times of January 19, 1985 explicitly exhibits: the Ethiopian Marxist regime received 2.5 billion US dollars in weapons from the Soviet Union, and donation of food by US would be a good counter to it as the Soviets could not or would not offer such aid (Fair, 1992, p115).

2) The discourse of aid donors

Humanitarian justification of food aid (ibid.). Western donors are 'the forces of good (ibid.). This type of discourse focused on 'the actions of U.S. government officials, Western relief workers, international agency staffs, and pop culture figures such as singers and actors (ibid.)'. "Humanitarian good" of aid was 'above the politics of Africa (ibid.)'. A correspondence stated in New York Times (November 29, 1984): 'Western conscience dictates that people should not be allowed to starve' (ibid.).

3) The discourse of aid recipients (governments of African countries)

Criticism of inefficiency of governments (ibid.) Ethiopia. Too many African countries, were 'associated with socialism / communism / Marxism' and 'poor agricultural system or government inefficiency' were frequently reported (ibid.). '*Times* coverage of U.S. food aid sent to Ethiopia used U.S. government officials (largely unnamed) to criticise the Mengistu regime as an ungrateful, corrupt Soviet ally that placed little priority on feeding its people (Fair, 1992, pp115-116)'. 'The Times's evidence of Ethiopia's low priority on feeding its people was to cite figures (varying from $3 million to $200 million in different news stories) for the celebration of the tenth anniversary of the revolution that brought Mengitstu to power. (Fair, 1992, p116)'.

4) The discourse of the people

> Stories of 'the African poor, of the hungry and of the refugees (ibid.)'. The stories were 'about them, not by them (ibid.)'. Such a story 'focused largely on how African farmers were unable to produce enough food, nor import the necessary agricultural technology from the West to increase their food production because of constraints put on them by their Marxist governments (ibid.)'. 'More commonly, news stories assumed the African's perspective, with phrases such as "the people hope it will rain" or "the people are hungry" (Fair, 1992, p117)'. 'Coverage of the people in food aid stories represents Africans as aid dependent and helpless, with little or no control over ensuing food shortages (ibid.)'. 'More indirectly, because the Cold War framework informed news coverage by providing a guiding perspective on African reality, news stories were not likely to draw on the experiences of the ordinary African (ibid.)'.

It is rational to assume that such primary discourses above can be easily interwoven and production of variations of the same discourses can be easily carried out. Like the packaged presentation of the Gulf War by CNN (Kellner, 1992, p257) looked at earlier, the packaged set of discourse in the coverage of the Ethiopian famine by New York Times offered a matrix to form a coherent structure of meaning and to mobilise public opinion for the specific policy. At this point, it is important to note that the action of food aid itself was no longer separable from the propaganda. They were mutually indispensable: News demanded food aid by US governments and NGO for Ethiopia as well as social normalisation of the discourses in the US and the "developed" countries, and the actions demanded to be reported. It is possible to see self-perpetuation here: Actions and propaganda through mass media form a positive feed back loop which accelerates and vitalises each. Fair (1992, p116) notes:

> Once the urgency for food aid was established, the discourse of aid giver and aid recipient delineated the boundaries of struggle between East and West in which Africa was a part, but in which Africans played a small role.

In other words, those discourses were no longer real but hyper-real in a Baudrillardian sense, as explained in the first chapter of this study. The media coverage of the famine in Africa offered a coherent structure of meaning in which Africa became insignificant.

The 'humanitarian Gresham's Law' identified by de Waal (1997, p139) in his analysis of famines in Africa illustrates another aspect of the collusion between aid agencies and the mass media.

> The humanitarian Gresham's Law works in this way. The agency most determined to get the highest media profile obtains the most funds from donors (both the public and donor governments). In doing so, it prioritises the requirements of fund-raising: it follows the TV cameras, employs pretty young women to appear in front of the cameras, engages in picturesque and emotive programmes (food and medicine, best of all for children), it abandons scruples about when to go in and when to leave, and it forsakes co-operation with its peers for advertising its brand name. Agencies that are more thoughtful - a category that includes most non-operational agencies (mainly church-related agencies that work through local partners/clients), consortia, and a handful of the older secular agencies - fail to obtain the same level of public attention, and suffer for it. They may be able to obtain a certain level of support from institutional donors and the more discerning public for their more authentic' programmes, but the greater pressure is in the opposite direction.

> The most common quantifiable measurements of agencies' effectiveness used in the media consist of the proportion of income spent on administration, the overall quantities of relief delivered, the number of 'volunteers' dispatched and the speed of response. Most important is simply the sheer amount of attention in the media and the volume and tenor of the agency's own advertising material. Other things being equal, the agency which is more media-aware will prosper at the expense of the less media-aware. In aid projects, media-friendliness does not correlate positively with effectiveness. Within a single agency, fund raisers and those adept at grabbing media attention will

prosper at the expense of those who grapple with the problem of making aid a genuine service to its target group. In short, 'hard' interests prevail at the expense of 'soft'.

Just as 'bad money drives out good money', media-aware agencies drive out not media-aware agencies. This law makes all aid agencies media-aware. Another phenomenon, 'disaster tourism', is also identified by de Waal (1997, p82)

> The predominant form of journalists' exposure to famine has been characterized as 'disaster tourism' (de Waal, 1987). This term was coined as a companion to Robert Chambers' 'rural development tourism' (Chambers 1983), which was an attempt to explain why visitors to rural area of poor countries so rarely appreciated the depths of poverty. Nothing that 'what the eye does not see the heart does not grieve about'. Chambers identified a set of biases in visitor's exposure, which meant that they saw better-off areas (aid projects, areas by the roadside) at better-off times of year, saw men rather than women, and did not question their hosts' optimistic assessments. In famine, these biases are thrown into reverse: the visitor (journalist, aid worker or dignitary) selectively sees the worst and assumes the worst from what he or she sees. Relief agency guides take visitors to the worst places (relief shelters) and are keen to stress the hunger and dependence of the people and the importance of relief. This leads to exaggerated, dire predictions and stereotypes of pathetic dependency.

News of Africa	**Reports of the Persian Gulf War**
Difficulty of reporting from Africa	Media pool system
Local 'censorship'	Prohibition of direct access to the troops
'Difficult travel conditions'	Control of travel of journalists in the Gulf
'Inadequate communication facilities'	'Security review' of news material
The four primary discourses (Fair, 1992), crisis, aid donors, aid recipient governments and people, for example, to serve interests of certain communities, which was placed in the Cold War framework	War presented as a high-tech, clean and justifiable spectacle by the mainstream mass media which was largely owned by and connected to the US military-industrial complex in the "New World Order"

Table 3.2.1 Comparison between news of Africa and reports of the Persian Gulf War

Then, naturally, 'Journalists know in advance what a "famine story" looks like and search for the right elements (ibid.)'. News and reports of disasters on TV and newspapers are destined to become parodic variations of previously existing news and reports. Africa becomes a permanent adventure playground detached from the rest of the world. This is identical to what Benthall (1993, p179) called 'disaster pornography' in his analysis of posters used by aid agencies (ibid.) to promote their activities to the public for fund raising. News of disasters in Africa are not separable from advertisements of aid agencies. This is operation of propaganda serving interests of decision making communities at the expense of local communities.

Further consideration on the connotation of media propaganda leads to an epistemological notion. Let us first make a comparison of media propaganda in news of events in Africa and that of reports from the Gulf War (table 3.2.1). The outcome of either of the columns of table 3.2.1 is void of meaning. Just like pornography, news from an African disaster or the Gulf War are not really news as meanings of the news are lost. The propaganda around those events was extremely Foucauldian in the sense that it served the dynamic immobility of the underlying structure, but the propaganda transcended from the structure of meaning to void at the peak of its function. With this understanding, the final comparison can be made on how the techniques and conditions which produce the images of the events came into existence. It was assumed earlier that the diversification of public perception in the US societies in the 1960 - the mid 1980s may have been the cause of the establishment of the media pool system and the propaganda in the Gulf war. This has not been proved and it is beyond the scope of this study to prove the point, but let us accept it as a hypothetical reference. A consideration can be developed as follows. Among the diversified public perceptions, discourses of anti-war existed. To counter such discourses in the 1990 and 1991 Gulf crisis, the Gulf War had to be cut off from daily lives in the US societies and presented as a high-tech spectacle. In the case of the Ethiopian famine, on the other hand, diversity of public perception in the US or any other "developed" countries was largely absent. It was because reports from Africa in general were scarce, and public opinions could be simply guided by the discourse of "humanitarian good will" as seen in the second and fourth primary discourse identified by Fair (1992, p116) mentioned earlier.

The process of propaganda on the Ethiopian famine, and on many other African events, is more subtle, softer and "warm-hearted" than that in an event like the Gulf War. African events do not even need to be "cut off" from daily lives in the "developed" world because they are physically and socially so distant anyway. They can be smoothly presented as a humanitarian spectacle which is totally "politically correct". De Waal writes (1990, p139):

> ...the 'Band Aid factor' distracts attention from the need to address the political causes underlying the famines in Ethiopia. The press tends to misrepresent famines and misrepresentation grows as the media coverage increases. Press attention to famine in Ethiopia and Sudan is essential. However, it is also essential that the coverage is politically informed. Over-hyped naively 'humanitarian' reporting can be as bad as no reporting at all.

Void of meaning that media coverage of an African event "achieved" can be detected in the above comment. This observation by De Waal echoes to the title of the paper by Fair (1992) featured in the previous section, 'Are We Really the World? Coverage of U.S. Food Aid in Africa, 1980-1989' referring to the title of the pop music record produced by US for Africa (USA) consisting of the US pop musicians. It is possible to see the boundary between the Foucauldian domain and Baudrillardian domain here. The media coverage was meaningful, or *real*, only in the sense that it maintained the Cold War framework, and mobilised the public in the US and other "developed" countries, but meaningless, or *hyper-real*, in the sense that it was something titled as news but not really news. In other words, what was reported denoted information but connoted propaganda. The event, famine, itself was not important but the image of the event was important. This phenomenon does not confine itself within the non-academic parts of societies in the "developed" countries. As seen in Section 5 in the previous chapter of this study and consideration made earlier in this section on the paper by McLean (1993), mass media inevitably influence activities of research communities directly as researchers are audiences and readers of news and indirectly through perceptions of governments and NGOs. Just as explained in the first chapter of this study, a simulacrum starts creating another simulacrum, and a symbol starts creating another

symbol, without any tie with the original state of the *real*.

3.3 Baudrillardian stalemate: propaganda and its destination

The main focus of this section is an examination of the validity of critical analysis of media coverage of African events as means to counter-attack propaganda and its Foucauldian structure. This is to answer the question raised at the end of the third point for observation of propaganda as explained in the first section of this chapter: Can a revelation of propaganda have any impact on saturated perceptions of the public and the ever unchanging Foucauldian mechanism behind them? Considerations made by Baudrillard are useful for determining the validity of the analysis of information provided by mass media. The question to be considered at this section is whether or not the critical analysis of media coverage of Africa can have any influence on mass media to interfere with its function as a tool for propaganda. In his essay titled 'Catastrophe Management', Baudrillard (1994) writes:

> The South is a natural producer of raw materials, the latest of which is catastrophe. The North, for its part, specializes in the reprocessing of raw materials and hence also in the reprocessing of catastrophe. Bloodsucking protection, humanitarian interference, *Médecins sans frontières*, international solidarity, etc. The last phase of colonialism: the New Sentimental Order is merely the latest form of the New World Order. Other people's destitution becomes our adventure playground. (p67)

> We are the consumers of the ever delightful spectacle of poverty and catastrophe, and of the moving spectacle of our own efforts to alleviate it (which, in fact, merely function to secure the conditions of reproduction of the catastrophe market); there, at least, in the order of moral profits, the Marxist analysis is wholly applicable: we see to it that extreme

> poverty is reproduced as a symbolic deposit, as a fuel essential to the moral and sentimental equilibrium of the West. (ibid.)

> ...we need this drug, which serves us as an aphrodisiac and hallucinogen. And the poor countries are the best suppliers — as, indeed, they are of other drugs. We provide them, through our media, with the means to exploit this paradoxical resources, just as we give them the means to exhaust their natural resources with our media, with our technologies. Our whole culture lives off this catastrophic cannibalism, relayed in cynical mode by the news media, and carried forward in moral mode by our humanitarian aid, which is a way of encouraging it and ensuring its continuity, just as economic aid is a strategy for perpetuating under-development. Up to now, the financial sacrifice has been compensated a hundred fold by the moral gain. (p68)

The point to be noted in reading these quotations is that, as far as the South in which Africa is a major component is concerned, propaganda is not fed to plain public perceptions as an agent to manufacture specific consents, but to our 'New Sentimental Order (ibid., p67)' as 'an aphrodisiac and hallucinogen (ibid., p68)' to let us gain 'moral profits (ibid., p67)' and to enable us to keep living off the 'catastrophic cannibalism (ibid., p68)'. In other words, propaganda labelled as news and reports is exactly what we want and need. There is a complicity between our humanitarian sentiments and propaganda. Recognising the existence of this complicity, validity of impacts made by revelations of existence of propaganda on the Foucauldian mechanism have to be seriously questioned.

The validity of the critical analyses of propaganda can be further degraded by the saturation of perception through the proliferation of information or repetition of the same 'folktale'. Baudrillard illustrates a spiral of the simulation of information leading to a 'void of meaning' in his analysis on the Gulf War (Baudrillard, 1995).

> Just as the psychical or the screen of the psyche transforms every illness into a symptom (there is

> no organic illness which does not find its meaning elsewhere, in an interpretation of the ailment on another level: all the symptoms pass through a sort of black box in which the psychic images are jumbled and inverted, the illness becomes reversible, ungraspable, escaping any form of realistic medicine), so war, when it has been turned into information, ceases to be a realistic war and becomes a virtual war, in some way symptomatic. And just as everything psychical becomes the object of interminable speculation, so everything which is turned into information becomes the object of endless speculation, the site of total uncertainty. We are left with the symptomatic reading on our screens of the effects, of the war, or the effects of discourse about the war, or completely speculative strategic evaluations which are analogous to those evaluations of opinion provided by polls. In this manner, we have gone in a week from 20% to 50% and then to 30% destruction of Iraqi military potential. The figure fluctuates exactly like the fortunes of the stock market. "The land offensive is anticipated today, tomorrow, in a few hours, in any case sometime this week ... the climatic conditions are ideal for a confrontation etc." Whom to believe? There is nothing to believe. We must learn to read symptoms as symptoms, and television as the hysterical symptom of a war which has nothing to do with its critical mass. Moreover, it does not seem to have to reach its critical mass but remains in its inertial phase, while the implosion of the apparatus of information along with the accompanying tendency of the rate of information to fall seems to reinforce the implosion of war itself, with its accompanying tendency of the rate of confrontation to fall. (pp41-42)

The amount of information flowing through TV and newspapers proliferates by day and by hours and the interpretations of such information also proliferate. Consequently, 'there is nothing to believe (ibid.)'. Both propaganda and its disclosure become neither credible nor incredible. Baudrillard (ibid.) understands it as 'the site of total uncertainty', in other words the *hyper-real* state. Media coverages of African events such as famine may not proliferate as dramatically as those of the Gulf War do, but the established narrative style as a template for news and reports plays the same role. Benthall (1993, pp188-189) explains the 'narrative convention' of

disaster relief on TV as follows.

A Russian scholar, Vladmir Propp, published *Morphology of the Folktale* in 1928 and it was translated into English in 1958, since when it has had a great impact on folklorists, linguists, anthropologists and literally critics. Here I will analyse the narrative of disaster relief, as it is typically represented in news and agency publicity, as a series of what Propp calls 'functions'.

I suggest that even when only a part of a narrative relating to disaster is shown on television - for instance, pictures of starving babies, or an aeroplane setting off from a familiar airport bringing supplies, or an ambassador thanking the public for their generosity - viewers come to recognise it as part of the total narrative conversion.

On this reading, the central character of narrative is the travelling *hero*, who may be an expatriate field worker, such as an officer of Oxfam of MSF, or a foreign correspondent. There is also in some cases a *villain* - a Pol Pot in the Cambodian crisis of the late 1970s, Saddam Hussein during the Gulf War. But, as Propp says, in those tales where no villainy is present, 'lack' or misfortune can serve instead, and it is noticed by a *dispatcher*. 'One can imagine that, prior to the beginning of the action, the situation has lasted for years, but the moment comes when the dispatcher or searcher suddenly realizes that something is lacking....'

Propp describes another essential character whom he terms the donor. The donor provide the hero with a magical agent sometimes in the form of a magical helper - clearly, in our case, the embodiments of Western abundance and technology in its various forms. After the hero has undergone various ordeals and solved difficult tasks, the misfortune or lack is liquidated. Hence we learn from an Oxfam Bulletin, admittedly twenty years old but commendably lacking in guile, of an Indian peasant sighing that the drought 'may be too big a problem for God; but perhaps OXFAM

can do something.'

Propp also draws attention to the false hero who presents unfounded claims and is eventually exposed. These are the impostors who start fake charities, or the incompetents who dissipate funds and send grotesquely wrong medicines, or the 'lords of poverty' - to borrow from the title of Graham Hancock's polemic against the UN.

The final member of Propp's cast is the princess. This may be any person of rank and/or charisma who intervenes and rewards. Save the Children (UK) has proposed particularly well since it acquired a real one in Princess Anne, its tireless and effective President.

Fairly tales, as everyone knows, have to have a happy ending. The agencies try to provide this, especially in their annual reports to donors and staff, with a favoured alternative to the image of distress: the image of gratitude.

With repetition of news and reports having a composition like the above on TV and newspapers, perceptions of the public have two possibilities. One of these is that the humanitarian sentiments of the public around African events may not just receive but welcome propaganda: Africa becomes a permanent adventure playground in the perceptions of the public. The other is that the perceptions of the public can be simply saturated: Africa becomes a permanently troubled continent detached from the rest of the world in the perceptions of the public. In either case, revelations of propaganda, critical analyses of media coverage of African events, can have a little impact on the system orchestrating propaganda.

An analyst may still try to defend the validity of the critical analyses of propaganda on the basis of the impacts of such attempts on his / her own perceptions. Observations by Kellner (1992), McLean (1993) and Fair (1992) featured in the previous section may be good examples in making such a defense. They certainly sensed the

Foucauldian mechanisms behind propaganda disguised as news and reports by cross-checking information, and one can detect the mechanisms influencing the material on TV screens and in newspapers by reading their analyses. Proliferation of information inevitably causes "traffic accidents": the possibility that one report contradicts , or clashes with, another report increases as the sum of media coverage increases. The most prominent example in Kellner (1992) is his investigation on the oil spills in the Gulf War based on comparisons of the US official announcements, main stream and alternative media coverage. The oil spills into the Gulf seemed to have been caused by the attack of the allies on Iraqi oil tankers and oil facilities occupied by Iraqi army, but reported and announced as an irrational and intentional 'environmental terrorism' of Iraq by US government and mainstream media, and the image of dying cormorants were shown on TV repeatedly to maximise accusations against Iraq and hence its dictator Saddam Hussein (Kellner, 1992, pp213-217). McLean's provocative challenge to the widely supported African population and environmental discourse was based on chronological discourse analysis utilising both conventional and alternative views taken from publicly available sources. Fair's identification of the four primary discourses was based on interpretation of coverage of the Ethiopian famine by the New York Times with references to critical media studies. It may seem that cross-checking of information slows down the rate of proliferation of information in one's rationalisation process by inserting a kind of logical filter, and enables one to retrieve the issue from the Baudrillardian domain (where meanings of events disappear) to the Foucauldian domain (where a network of consensus can be formulated). These studies are extremely interesting, but are not their meanings also swamped and lost in 'humanitarian sentiments' and in the saturation of the perceptions of the public?

Such results of insightful cross checkings are only persuasive interpretations and one can not support or refute them conclusively and incontrovertibly because, as Kellner himself admits, 'other accounts are also plausible (Kellner, 1992, p13)'. Those revelations of propaganda may be useful for academic interests, but what impacts have those studies made on the system of orchestrating propaganda? They can not lead to any fundamental change. There is always only circumstantial evidence to verify streams of news as propaganda. One can only

doubt what seem to be bare honest reports of facts as propaganda. While it is sometimes possible to disclose the existence of propaganda after it is orchestrated, it is impossible to prevent a forthcoming propaganda event. Moreover, the proliferation of information enabled Kellner (1992), McLean (1993) and Fair (1992) to present alternative views, but at the same time, the doubts and the revelations of the underlying mechanisms behind propaganda, would contribute to the proliferation of information in the case of the Gulf War and saturation of perception in the cases of African issues. A critical examination of "pornography" cannot help being "pornographic". At this point, it is possible to see a complex collusion of the Baudrillardian and the Foucauldian domains: researchers' challenges of propaganda become a part of the proliferation of information and 'the saturation of meaning', and hence contribute to the ever unchanging consensus networks. the following remark made by De Waal (1997, p85) is helpful here.

> For spurring relief action, the international media are a blunt and unreliable instrument. For holding relief institutions accountable, they are practically no use at all. For those reasons, they are closely embraced by the humanitarian international.

After all, any analytical attempt in the contemporary information-rich societies would be absorbed by, or contribute to the dynamic immobility of, the Baudrillardian 'site of total uncertainty (Baudrillard, 1995)' where quasi humanitarian sentiment prevails. It is necessary to watch cautiously propaganda orchestrated by the mass media, but, at the same time, it has to be understood that such observations would result in neither the elimination of propaganda nor the fair media coverage of African events. This can be called the Baudrillardian stalemate in contrast with the Foucauldian stalemate found at the end of Section 6 of the previous chapter.

Chapter 4: Foucauldian and Baudrillardian Mechanisms

4.1 Introduction

Attempts to summarise graphically the concepts discussed so far in this study are made in this chapter. The preceding two chapters, Chapter 2 and 3, flesh out the Foucauldian and Baudrillardian concepts in relation to events in Africa. The graphical efforts in this chapter are to place those concepts in meta- perspective. An effort will be made to map effectively the modes of information proposed in the first chapter. A preliminary graphical attempt appears in Section 2 of this chapter. The Foucauldian mechanism in relation to actions and information flows within and around Africa is illustrated in Section 3. The diagrammatic analyses of the effects of the Baudrillardian information flows is in Section 4. Finally the possibility of a breakthrough of the Foucauldian and Baudrillardian stalemates is considered in Section 5. What is discussed in Section 5 is based on the understanding of the Foucauldian mechanism and Baudrillardian uncertainty gained from the preceding chapters, and offers the conceptual foundation for discussions in the remaining chapters of this thesis.

The most important implication presented in this chapter is that an escape from the Foucauldian or Baudrillardian stalemate cannot be easily made, or is impossible. Scientific information, or academic consumables, self-perpetuate in the Foucauldian mechanism, and media reports and news, or humanitarian consumables, self-perpetuate in the Baudrillardian mechanism. Individuals of local communities who face environments directly are inevitably marginalised in such mechanisms. Paradoxically, these individuals of local communities are, however, reaching 'reality' because of the marginalisation as the comments of Ochieng (1992) imply in Section 5 of this chapter. What he argues (ibid.) is neither an academic hypothesis nor a media report but 'truth' for himself and his people. Is it possible to let such 'truth' have an impact on the Foucauldian and Baudrillardian mechanisms prevailing in the world? This question arising at the end of this chapter links the

considerations so far with the remaining chapters of this study.

4.2 Compositions of communities and academic disciplines

> The core-disciplinary and the interdisciplinary approaches are only two sides of the same coin. They stand on the same matrix. Unfortunately the two approaches can only fully function, or supplement each other, in retrospect. Their applicability to an ongoing event has a limit. Only when a set of successive events is cut off from the ongoing time, and presented as a completed story, can the two approaches effectively reinforce each other. (See p106)

The first graphical effort is to indicate relative positions of two communities, the local and the decision making. As observed and analysed in the first and second chapter of this thesis, phenomena such as famine, drought or desertification become issues in distinctive ways among the different communities. This can be understood as the contrast between physical involvement and administrative and political concern in relation to environments and their resources. Local communities physically interact with environments while decision making communities deal with, by definition, policies. With this understanding, identification of positions of the two types of communities on an axis formulated by the notion of 'distance' from physical environments becomes possible as figure 4.2.1 shows. The central double-headed arrow indicates the distance between the physical and ideal, or the natural to artificial. Environments, local communities and decision making communities take a particular position on this axis. Here, what is generally called environment is understood as the interface between human communities and Nature as an entity independent from human activities. Local communities are the particular subset of human communities which are almost a part of this interface. Regional and National governments are totally artificial entities which are distant from Nature in comparison to local communities. International organizations such as UN agencies and NGOs in "developed" countries are even more distant from environment. While agricultural practice is the main activity for local communities, administrative and political operation is the principal task for decision making communities. What figure 4.2.1 represents must not be confused with hierarchy, or a holon system, of domestic and international administrative order. The intent of

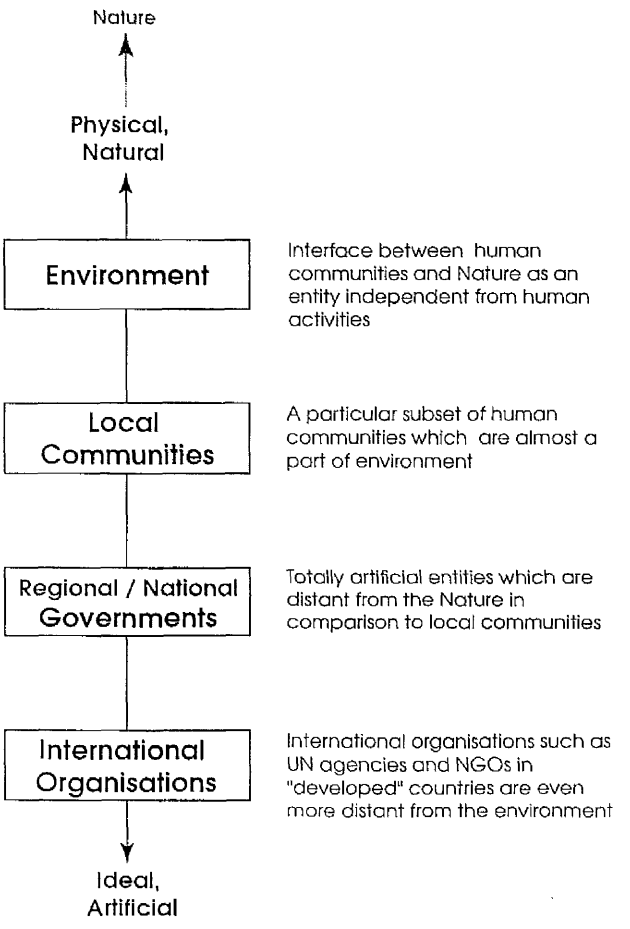


Figure 4.2.1 **Position of Communities:**
The contrast between physical involvement and administrative and political concern in relation to environments and their resources

this figure is not representation of the system in which a unit is a subset of the larger subset, but an indication of 'distance' that a type of community has from Nature. Having understood this point, the axis can be used to illustrate a spectrum of academic disciplines as shown in figure 4.2.2. Ecology is about Nature as an entity independent from human activities, and environment as the interface between Nature and human communities. Land use study is about phenomena taking place in the land-atmosphere interface. Socio-economics is about phenomena in human societies at domestic and higher levels, while politics (political science) is not just about domestic affairs at the national level but also with international relations. The scope of a cultural or historical

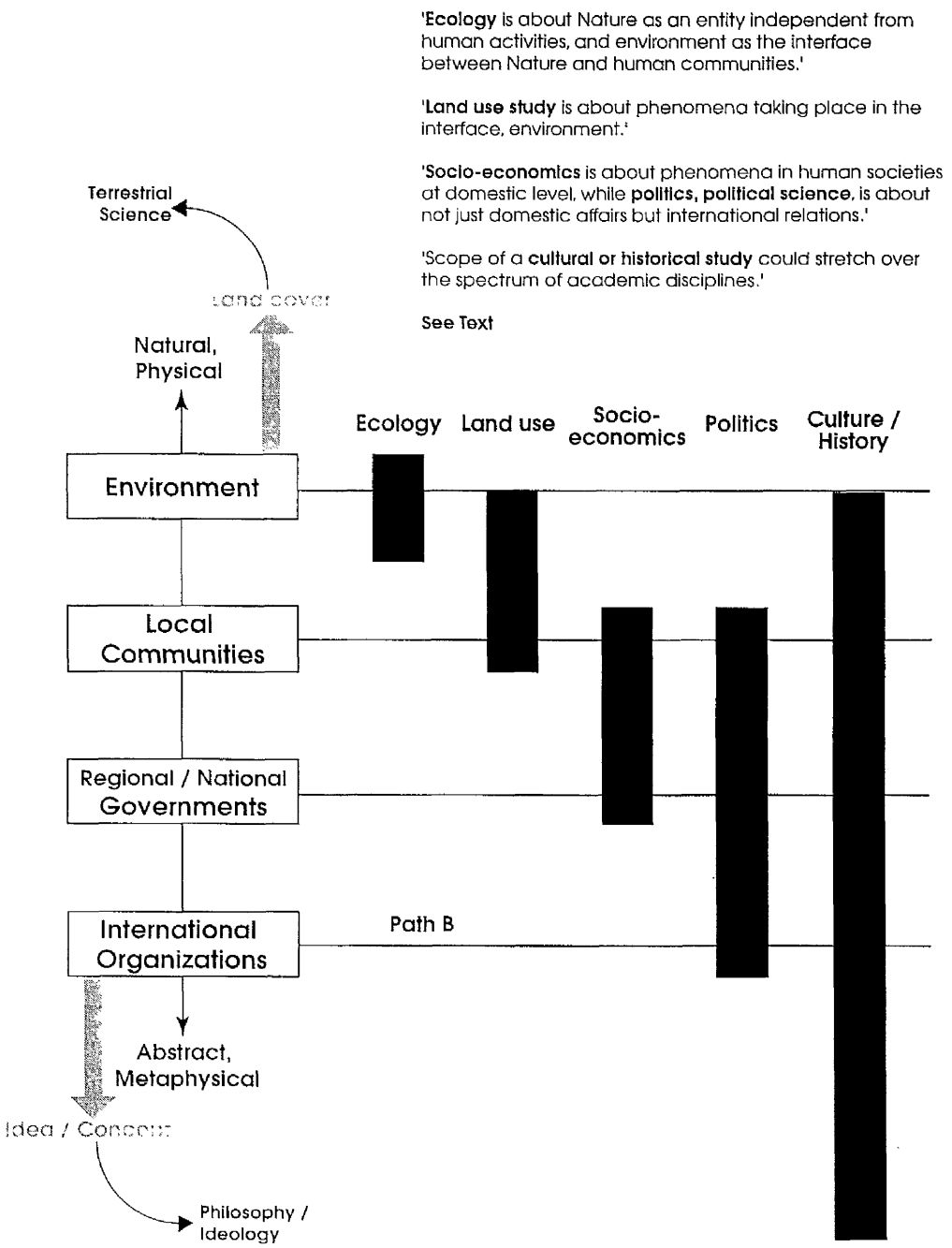


Figure 4.2.2
Spectrum of Academic Disciplines

study could stretch over the spectrum of academic disciplines. It is, of course, possible to itemise a more specific and focused academic spectrum, but those disciplines shown in figure 4.2.2 are sufficient for discussions to be made in this chapter.

The axis explained above can be used for representation and consideration of interactions among the actors. To start with, figure 4.2.3 shows three types of such interactions as paths:

1) Domestic interactions between environment, local communities and governments go through Path A.

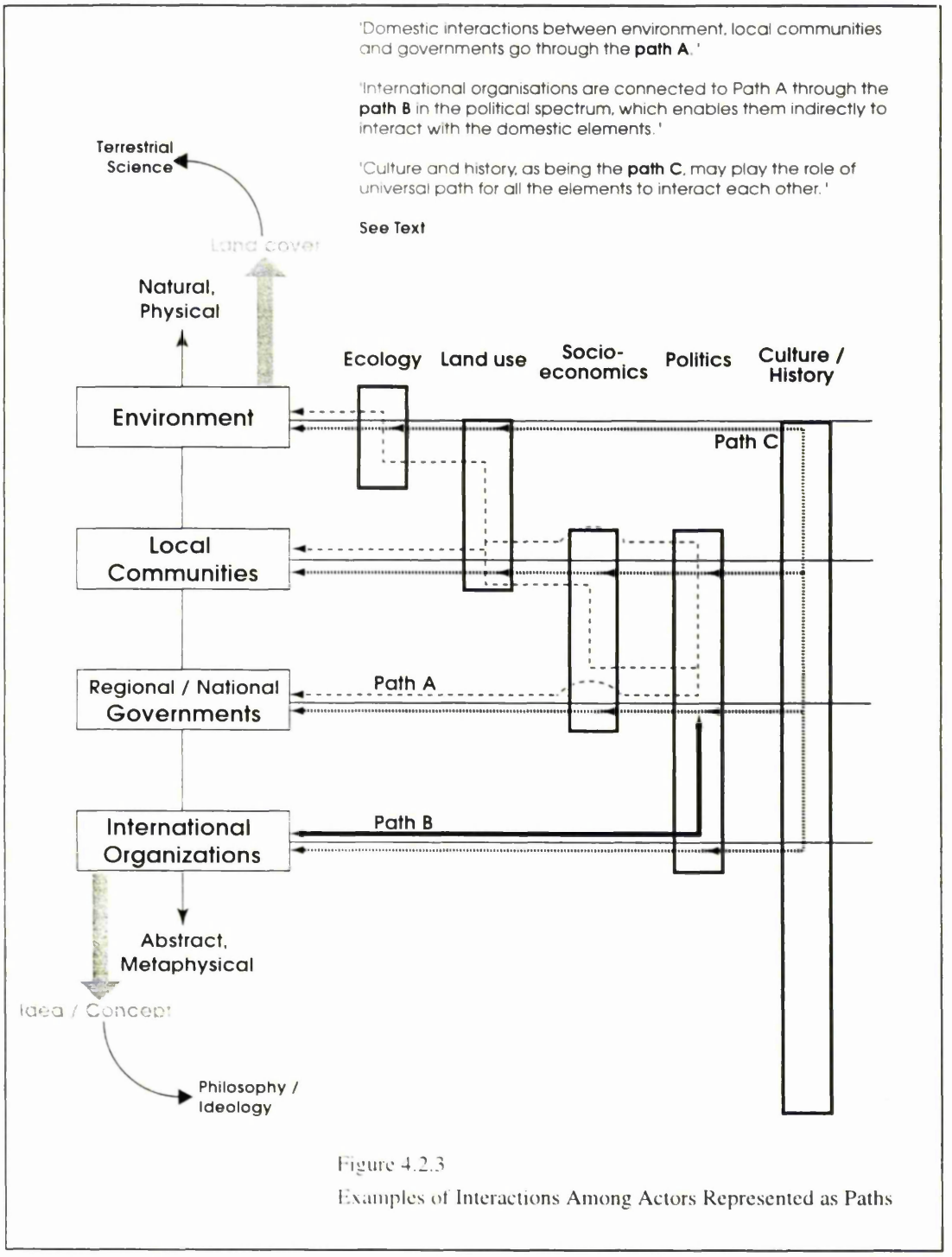


Figure 4.2.3
Examples of Interactions Among Actors Represented as Paths

2) International organisations are connected to Path A through Path B in the political spectrum, which enables them indirectly to interact with the national and sub-national domestic elements.

3) Culture and history, is linked via Path C, and may play the role of a universal path for all the elements to interact with each other.

These paths may join each other. By adding the time factor as another axis, the above elementary comprehension can be elaborated to represent and analyse a range of scenarios. For example, the hypothetical 'disaster story' made by Kent (1987) featured in table 4.2.1 can be represented as figure 4.2.4. The number of each text block in table 4.2.1 corresponds to the same number placed in figure 4.2.4: (1) in table 4.2.1 corresponds to the first text block in table 4.2.1, (2) to the second paragraph, and so on. Each of the arrows connecting the numbers in figure 4.2.4 indicates a process in which a cause produces a result. The time axis in the figure shows the four year time period in which the hypothetical story took place. The first three text blocks in table 4.2.1, (1), (2) and (3), explain how 'the new military government (Ibid.)' came into existence in what kind of country (geographical area), and how the outside world responded. The fourth text block is the result of the second text block, at the same time, is the cause of the fifth and sixth text blocks. The crisis of this hypothetical country starts emerging in the text block 7 and becomes fully visible in the last text block. In this sequence, it is reasonable to assume that although the crisis was triggered by 'the second year of rain failure (ibid.)', its foundation had been built up in the past four years or in even longer time period. Three of the such foreshadows for the crisis are shown as break lines on the figure:

a) Although it is not explicitly mentioned in the hypothetical story, it is reasonable to assume that lack of adequate water management, mentioned in the text block 6, increased the impact of the rain failure;

b) What the rain failure directly triggered was people's discontent about the shortage of food which had been caused by the decrease of food production through the government decision and farmers' reaction to it as told in the text block 4 and farmers' abandonment of their plots

1	Imagine a country which has recently become independent, a country comprising an amalgam of geographically-based ethnic groupings. It is essentially an agrarian society, with a relatively limited amount of export earnings based upon two cash crops. The inability of previous governments to feed the burgeoning population in the capital and the discontent amongst various ethnic groups who had felt excluded from political and economic participation have led to a military coup.
2	The new military government, whose senior officers mainly represent members of a small but 'traditionally military' minority, must face as did their predecessors, what one analyst has called 'the gap between promise and reality'. A weak administrative structure and limited revenue increase that gap. Nevertheless, there is no doubt in the leadership's minds that the urban population of the country must be given priority attention. This priority is reflected in the introduction of subsidised food to urban areas. However, despite this priority, land reform for the present population represents a close second.
3	Although the coup has been greeted with mixed reactions by the outside world, few are willing to condemn it outright. In part this muted response is due to the fact that the coup appears to offer a modicum of stability to the region, and in part because there are still repayments due on loans for industrial development projects that had been undertaken over the past ten years. These loans and interest payments, it is hoped, will be covered by income generated from export crops.
4	To maintain subsidised food prices, the government decides that the only alternative is to pay below-market prices for farmers' produce. The farmers, faced with declining incomes, find that the purchase of seed and fuel has become very much more expensive. They cut back on production, and, although land reform has provided them with small plots of their own, the need for fuel forces them to cut down the few trees they have available
5	Reduced production obviously limits the amount of food available not only for rural but for urban populations also. It also means that agriculture offers fewer and fewer opportunities, and many farmers and their families abandon their plots and move to the capital city. There, with no employment prospects and little, if any, money, they join the growing numbers of slum-dwellers inhabiting the steep slopes of the hills which surround the capital.
6	The increasingly deforested lands of those farmers who remain on the land are now more and more subject to erosion. Much of the rainwater, instead of sinking into the soil, runs off the land and escapes into rivulets winding down barren, rocky hills. There are insufficient resources to dig new wells and water catchment projects have been delayed because of other national priorities.
7	The fourth anniversary of the coup has ominously coincided with the second year of rain failure. Very few crops have grown, and the rural population hoards a considerable portion of its meagre harvest. The government all the while is obsessed with the need to maintain sufficient and subsidized food for the capital. However, the reality is that there is increasingly less food to subsidize. Black market prices quadruple within three months, leaving the vast majority of the urban poor with little access to food. Discontent within the city increases and, at the same time, famine in the country side is signalled by large groups of peasants journeying to the capital in search of assistance
8	With few resources to stem rising discontent, the government resorts to force in order to quell the growing number of disturbances. Ethnic solidarity creates divisions within the ranks of the army and the police force, and soon these divisions are reflected in a general breakdown of authority not only in the city but in rural areas as well. In the wake of mounting disorder, security can no longer be assured. Various factions of the army turn against those who do not belong to their own ethnic communities. Villages are looted and burnt, and many of the inhabitants are killed. The only resource for those who remain is to flee to the security of the neighbouring states. As refugees pour across the border, the problem of famine is further compounded, for many of those who could have prepared the next season's growth are now refugees or else dislocated within their own country

Table 4.2.1 Hypothetical Disaster Story
Source: Kent (1987)

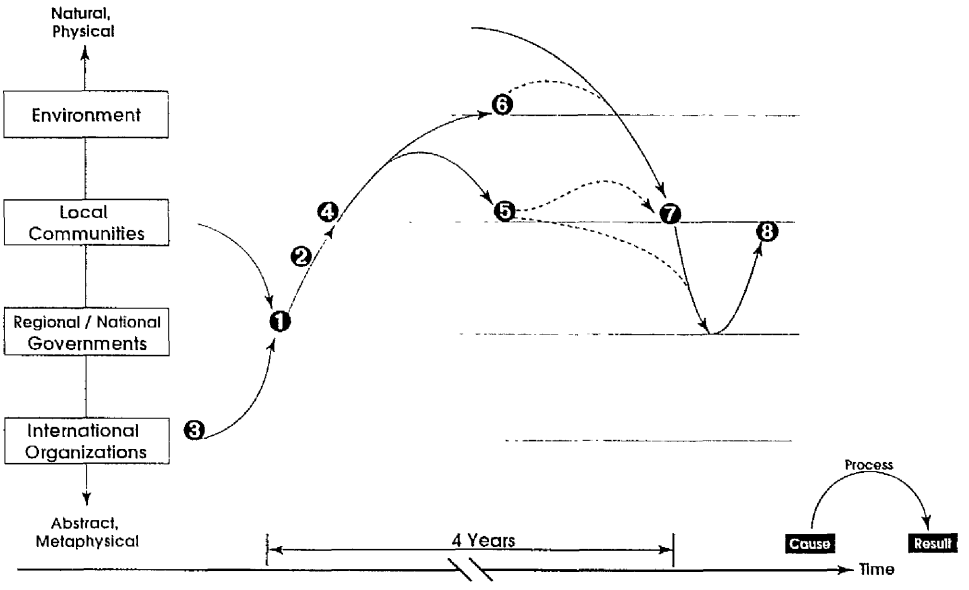


Figure 4.2.4
Hypothetical Disaster Story

in the text block 5; and

c) The expansion of the slum dwelling in the text block 5 must have raised social tension in the capital, which induced outbreak of violence in the eighth text block.

Besides the three break lines, it is possible to trace back one cause even further: The 'breakdown of authority' caused by 'divisions within the ranks of army and the police force' in the text block 8 took its root in the genesis of the 'new military government', of which 'senior officers mainly represent members of a small but 'traditionally military' minority as told in the text block 1 and 2.

An examination of figure 4.2.2 and 4.2.4 together leads to an interesting discussion. The two figures indicate what part of the hypothetical story shown as table 4.2.1 can be analysed by what academic discipline. For example, the text block 2 would be well analysed as a subject in socio-economics as well as in politics, the text block 5 in study of land use, and so on. Observing the correspondences between the phases in the story and the academic disciplines, two contrasting arguments can be made. One is to advocate concentration of attention on one particular phase of the story corresponding to one academic discipline leaving the other phases and

disciplines as backgrounds, namely, a core-disciplinary approach. The other is to promote comprehensive diffusion of analytical efforts over all the phases and corresponding disciplines, namely, the interdisciplinary approach. Interestingly, both these two approaches would evolve an Epimenidean loop explained in section 1 of the first chapter of this study. The core-disciplinary approach seems to have an advantage for the specific detection of problems and capabilities to make concrete suggestion for solution, but requires the interdisciplinary efforts as the preliminary foundation to identify what discipline is relevant for what phase of the consequences. The interdisciplinary approach seems to have an advantage in holistic understanding of consequences, but requires the core-disciplinary approach as the preliminary foundation to detect links between the phases and disciplines. The relevance of core-disciplinary approach would be haphazard without a wider interdisciplinary point of view, and the interdisciplinary approach would be superficial without the depth of analysis which can be provided by core-disciplinary efforts. In short, one is essential for the other.

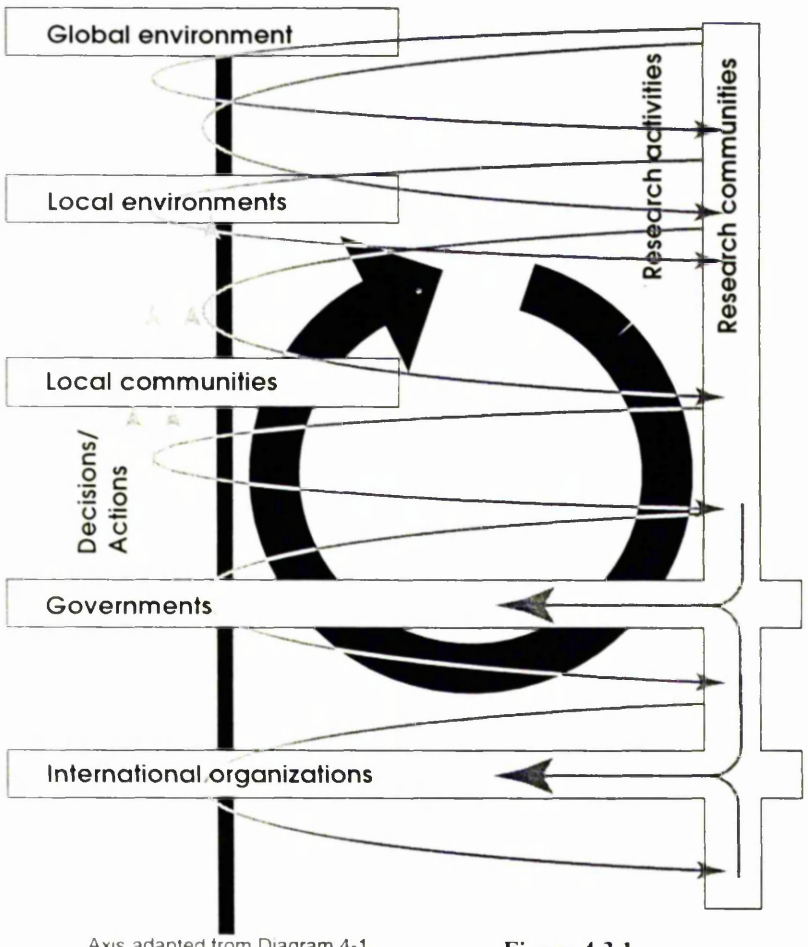
The core-disciplinary and the interdisciplinary approaches are only two sides of the same coin. They stand on the same matrix. Unfortunately the two approaches can only fully function, or supplement each other, in retrospect. Their applicability to an ongoing event has a limit. Only when a set of successive events is cut off from the ongoing time, and presented as a completed story, can the two approaches effectively reinforce each other. If "we" are at the first phase of the hypothetical story illustrated as text block 1 of table 4.2.1, is it possible for "us" to predict the consequences described by the text block 2 and 4 to 8 with precision? The number of possible repercussions is too enormous for "us" to foresee reliably. It is comparable to a game of chess: the number of possible moves of pieces is enormous at the outset of the game; it becomes small enough for precise foreseeing only in the very last phase of the game; and when the last phase would be achieved is often unpredictable before the last phase is actually achieved. It is possible to say that the relevance of a specific move or the effectiveness of the players' overall strategies in a game is hard to judge before the end of the game just as core-disciplinary and interdisciplinary approaches cannot be fully effective to tackle the next phase of a event, or a crisis, as a part of larger ongoing environmental and social dynamisms.

Someone with an empirical approach may argue that knowledge fostered from core-disciplinary and interdisciplinary approaches to past events completed as stories will eventually break out from the Epimenidean loop and enable "us" to predict both the short and the long term future of ongoing events as experienced chess players foresee and judge situations and the necessity of specific moves in an ongoing game. This encouraging assumption, however, misses two points. First, while the rules and the frames such as the size of the board, the number of grids or the available pieces are fixed all through past and future games of chess, frames and rules of events in Africa cannot be simply standardised. Each event has its own frames and rules. Moreover frames and rules change over a time period even in events of the same type such as famine or drought in the same geographical area. If chess players had to play a game with a completely different set of frames and rules every time, they would not be able to foster any coherent scheme of skill for the next game consisting of yet another new set of frames and rules. Secondly, researchers undertaking core-disciplinary or interdisciplinary approaches and their communities are not the equivalent of chess players in the sense that they are not directly involved in the game. A researcher may think that "if the local communities had taken the action A" or "if the international NGO did the action B", but never "we should do the action C". The equivalent of chess players in events in Africa are environments, local communities and decision making communities. Research communities analyse but not execute actions in events. It is an interesting question whether or not one who has been studying past games but not ever directly played any can employ relevant strategies and make appropriate moves in a complex game with a new set of frames and rules which he / she has not ever seen before. Evaluation of the empiricists' argument is beyond the scope of this section, and the question raised above shall be left aside. This second points, however, seem to be helpful in identifying the position of research communities, "we" or "us" in other words, in relation to the elements featured in figure 4.2.1 as explained below.

4.3 Communities and Foucauldian mechanism

The second graphical effort begins with the addition of research communities to figure 4.2.1. There are three points characterising the position of research communities in relation to environments and the other communities shown in figure 4.2.1:

1) In terms of distance, research communities are both close to and far from environments. On one hand, some disciplines are about environments or even about Nature itself, and the distance between environment and this end of research communities is short. On the other hand, some other disciplines in research communities such as politics in international relations are far from the environment;



Axis adapted from Diagram 4-1

Figure 4.3.1
Flows of information among the communities and environments

2) Research communities cannot be placed on the same axis as environments and the other communities in figure 4.2.1, if the existence of action by a relevant player is considered a necessary condition to be on this axis; and

3) Research communities are related to interactions among the elements featured in figure 4.2.1 through certain channels.

These points can be derived from the arguments in the previous section as well as from those in chapter 2 of this study. The variation of research activities mentioned in Chapter 2 of this thesis offers concrete examples to prove the necessity of the first point for further consideration, and the spectrum of academic discipline shown as figure 4.2.2 already illustrates the notion to an extent. The first point is related to the decision that the second point implies: the first point implies that research communities cannot be a point on the axis shown as figure 4.2.1 but as a line on the axis, the axis itself. It seems to be logical to represent research communities as an independent axis parallel to the axis shown as figure 4.2.1: the axis of local and decision making communities indicates the degree of physical involvement to environments and hence interactions taking place among them, and the newly introduced axis represents the scientific spectrum of research communities. The third point is evident from observations in chapter 2 of this study: the famine models developed in research communities resulted in the famine early warning, and food information, systems (chapter 2, section 2); the output from the remote sensing scientists determined perception of UNDRO in the Ethiopian famine in 1984 (section 3); and academic frames become consumables to serve interests of decision making communities (section 5). From those examples, the channels through which research communities are related to the axis of figure 4.2.1 can be illustrated as pipes between the axis of the research communities and governments and international organizations on the other axis.

Considerations made so far can be developed in figure 4.3.1. The clockwise circulation of information among the communities and environments in this figure is shown as the central circle with an arrowhead. More concretely, the explanation of this figure is as follows:

1) The arcs attached to the research communities represent research activities. Depending on its academic interest, an academic observation occupies a certain spectrum corresponding to a domain, or a point, on the axis consisting of the communities and environments;

2) Information collected by the research communities is fed to the decision making communities such as governments and international organizations;

3) The decision making communities, governments and international organisations, make decisions and actions which might or might not use the analysis of researchers. Those decisions and actions are to be imposed on local communities and local environments, or gradually attenuated in effect; and

4) Decisions made and actions taken as well as their effects are again studied and retrieved as information by research communities.

An additional comment to this figure is that 'Nature' in figure 4.2.1 can be replaced with the term 'global environment' to limit the extent of the consideration for relevance to this study.

It becomes possible to illustrate the Foucauldian mechanism on the basis of the graphical analysis made so far. Figure 4.3.2 represents the clockwise circulation of information but not self-perpetuation of information as the objective of the mechanism. In figure 4.3.2, the communities and environments are placed in the context of the Foucauldian mechanism, an 'anti-politics machine', which is discussed in Chapter 2 of this study. All the communities are placed on the black background representing the Foucauldian domain where discourses compose power as networks of consensus. The extent of the black background ends at local environments. Physical interactions take place beyond local environments. It is possible to say that if such physical interactions are regarded as clashes of forces, this figure is, in essence, an elaboration of the first set of domains in figure 1.2.1 shown in the second section of Chapter 1 of this thesis. Local communities on figure 4.3.2 are literally the periphery of Foucauldian power: local communities face their environments with a consensus which cannot be

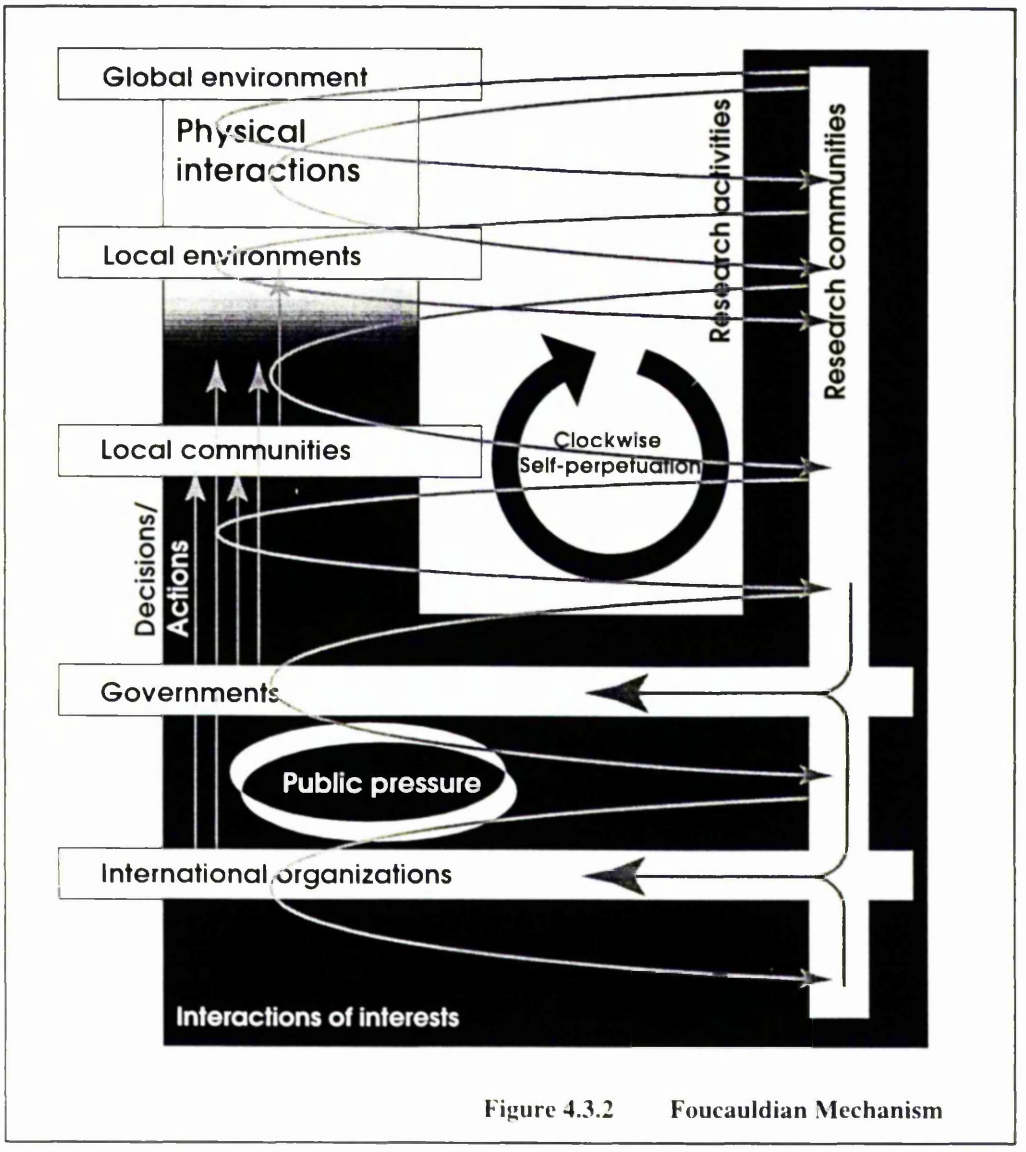


Figure 4.3.2 Foucauldian Mechanism

shared with the other two communities. At the same time, they are subjected to a Foucauldian consensus conceived in the area between themselves and their governments. Decision making communities transform knowledge, or information, provided to them from research communities into consensus to be actualised as decisions and actions imposed on environments and societies at both the domestic and the international levels. An academic hypothesis taking the form of reports, articles and the presentations is not more than material to study within research communities, but it starts mimicking truth as soon as it is fed to decision making communities. The four points explained in section 2 to section 5 of chapter 2 add further depth to understanding of figure 4.3.2:

1) **Autonomy of the evolution of scientific / professional discourse (Section 2 in Chapter 2)**

The evolution of famine models took place autonomously within research communities. The models did not end as pure academic hypotheses. They were fed to decision making communities through the horizontal pipes shown in figure 4.3.2. At some point of this feeding process, hypotheses are transformed into 'information' which functions as 'truth'. Discourse, famine early warning systems and food information systems were constructed and run based on those 'temporary truths'. Research communities, then, again observe those systems and compose new hypotheses which go through the same process, and 'a new generation of truths' is produced. In this circularity, Foucauldian power emerges as network of consensus, and individuals in any of the communities becomes 'vehicles of power (Foucault, 1980, p98)'. At this point, it has to be noted that the circularity is not collective effort directed towards a solution as a synergistic outcome but is a self-perpetuation for the continuation of the mechanism itself.

2) **Schism of Foucauldian power (Section 3 in chapter 2)**

The variation of definitions of drought suggests that the clockwise perpetuation of information shown on figure 4.3.2 creates variations of consensus all over the mechanism. Understanding of a phenomenon, drought in this case, in one community can be strikingly different from the understanding of the same phenomenon in another community. The amount of quality environmental information required for an organization or a group of people to understand the perceptions of another community would be enormous. Information circulates in the mechanism, and at the same time, separates communities. Each community holds a consensus based on its own version of 'truth'. Networks of consensus do not lend to homogeneity but to schism. This characteristic contributes to the self-perpetuation of the mechanism as the heterogeneity of consensus creates new research opportunities for research communities.

3) **Determinants and characteristics of the arena for hypothesis creation (Section 4 in Chapter 2)**

Robust logic is a means to verify the trustworthiness of a hypothesis within research communities. Data collected from the field are supposed to connect the robust logic of the hypothesis to the material world. Acquisition of socio-economic data in Africa, however, is not an easy task, and the quality of existing African data cannot be used without reservation. In other words, the ground for hypothesis creation is not firm. A hypothesis about Africa involves tremendous uncertainty, and supplements and challenges to the hypothesis cannot help being built on the same uncertainty. Then, hypotheses stalk their own tails. This self-perpetuation within research communities support and resonates to the larger self-perpetuation of the mechanism shown in figure 4.3.2.

4) **Structure of interest generation, or absence of interests, for the communities (Section 5 in chapter 2)**

The self-perpetuation of the above mechanism serves the interests of research and decision making communities but not local communities. Research and decision making communities can justify their expansion through the process of self-perpetuation and the resources it generates. Under all academic hypotheses and political actions, there is the underlying structure which is illustrated by figure 4.3.2. The local communities at the periphery of the Foucauldian system, at the fading edge of the black background on the figure, do not receive benefits from the self-perpetuation.

These points reinforce each other, and the established self-perpetuation absorbs any attempt to break out. For example, figure 4.3.2 denoting a hypothesis in research communities may become a consumable to be exported to decision making communities as a source of 'temporary truth', and thus contribute to the prolongation of the self-perpetuation. As noted in Chapter 2 of this thesis, it is a stalemate, and investigation of methods for resistance to the Foucauldian mechanism needs further consideration.

Let us see an example to which the above considerations can be applied. In his study of refugee camps in Africa, Keen (1992, p 64) writes:

> The French historian Michael Foucault once described the prison system as 'the despicable solution which we seem unable to do without'. He put forward the idea that even when particular practices do not appear to be achieving their avowed ends (for example, preventing crimes), they may nevertheless be serving a number of other, often hidden, functions (for example, creating a class of criminals who could be easily monitored by the police). Now whether or not Foucault was right about the prison system, his insights are nevertheless suggestive. In particular, it would seem reasonable to ask: if refugee camps have so often been unhelpful in terms of their avowed purpose (refugee welfare), why then have they been so common and so persistent?
>
> There can be legitimate reasons for creating camps. Camps offer one way of managing the difficult task of carrying out speedy distributions of relief to large numbers of people. In some circumstances, a concern for the physical security of refugees may call for the creation of camps.
>
> However, a number of academic observers have suggested there may be other reasons for the continued popularity of camps. Wilson points to: '...concerns for security and control, a need to manage a population to administer aid to it, and a pernicious paternalism.'
>
> Another possible reason is that refugees gathered in camps are also more visible: it may often be easier to attract funding for such projects than when refugees are scattered, and at least partially hidden, in the midst of a host population. Barbara Harrell-Bond and Mark Leopold at the Oxford-based RSP argue that bureaucratic organizations typically aim for 'accountability' - they want to be able to show that their relief has reached the intended beneficiaries and only the intended beneficiaries. They also need figures on the numbers of these beneficiaries. 'Factoring out' refugees from the host population by placing them in camps offers one way of achieving these goals.

This observation is insightful. Just as the prison system might have a dualistic structure consisting of the

ostensible discourses and the functions behind, refugee camps might stand on the obvious technical necessities and the unseen utilities for decision making communities. Considerations of the Foucauldian mechanism so far in this section can add another depth to this composition. It is that such academic observations revealing the dualism of refugee camps would, after all, only form a set of new discourses of refugee camps. Observation of the dualism of refugee camps is one thing, feasibility to alter the despicable solution is another. The unseen utilities of refugee camps are, in fact, the reasons and motivations for decision making communities to create and manage the business of refugee relief, as well as the resources for research communities to carry out researches. The role of refugees is structurally determined to be material for the interests of the other two communities. The networks of consensus for refugee camps, knowledge of the technical necessities, and the hidden functions of such camps have research and decision making communities at its pivot and refugees at its periphery. Suggestions by researchers may improve the cosmetics of refugee camps but would never alter the composition itself. To understand this impossibility of alteration, it may be useful to read Foucault's description (1991, p226) of how the dualism of the prison system has been forming, and still forms, a self-perpetuation.

> .....In a very strange way, the history of imprisonment does not obey a chronology in which one sees, in orderly succession, the establishment of a penalty of detention; then the recognition of its failure; then the slow rise of projects of reform, seeming to culminate in the more or less coherent definition of penitentiary technique; then the implementation of this project; lastly, the recognition of its success or its failure. There was in fact a telescoping or, in any case, a different distribution of these elements. And, just as the project of a corrective technique accompanied the principle of punitive detention, the critique of the prison and its methods appeared very early on, in those same years 1820 - 45; indeed, it was embodied in a number of formulations which — figures apart — are today repeated almost unchanged.

This observation is followed by explanations of concrete effects of the prison system identified between 1820 and 1845 and still seen today such as the one mentioned by Keen (1992, p64) above. Those attempts to alter the dualism, or the great failure, of the prison system failed one hundred and fifty years ago, and it still remains

unchanged today. The circularity detected by Foucault is parallel to the circularity in figure 4.3.2. If the terms in the Foucault's description (1991, p226) above such as 'imprisonment', 'penalty of detention', 'penitentiary technique', and 'punitive detention' are replaced with a term common in development studies such as 'refugee camps', 'famine early warning system' or 'amelioration of drought impacts', a historian in the twenty second century may make a similar comment in his / her writing about geo-graphical information of Africa. This is the Foucauldian stalemate.

4.4 Manoeuvres of images in a Baudrillardian mechanism

An appropriate beginning for a graphical analysis and explanation of fast flows of information discussed in

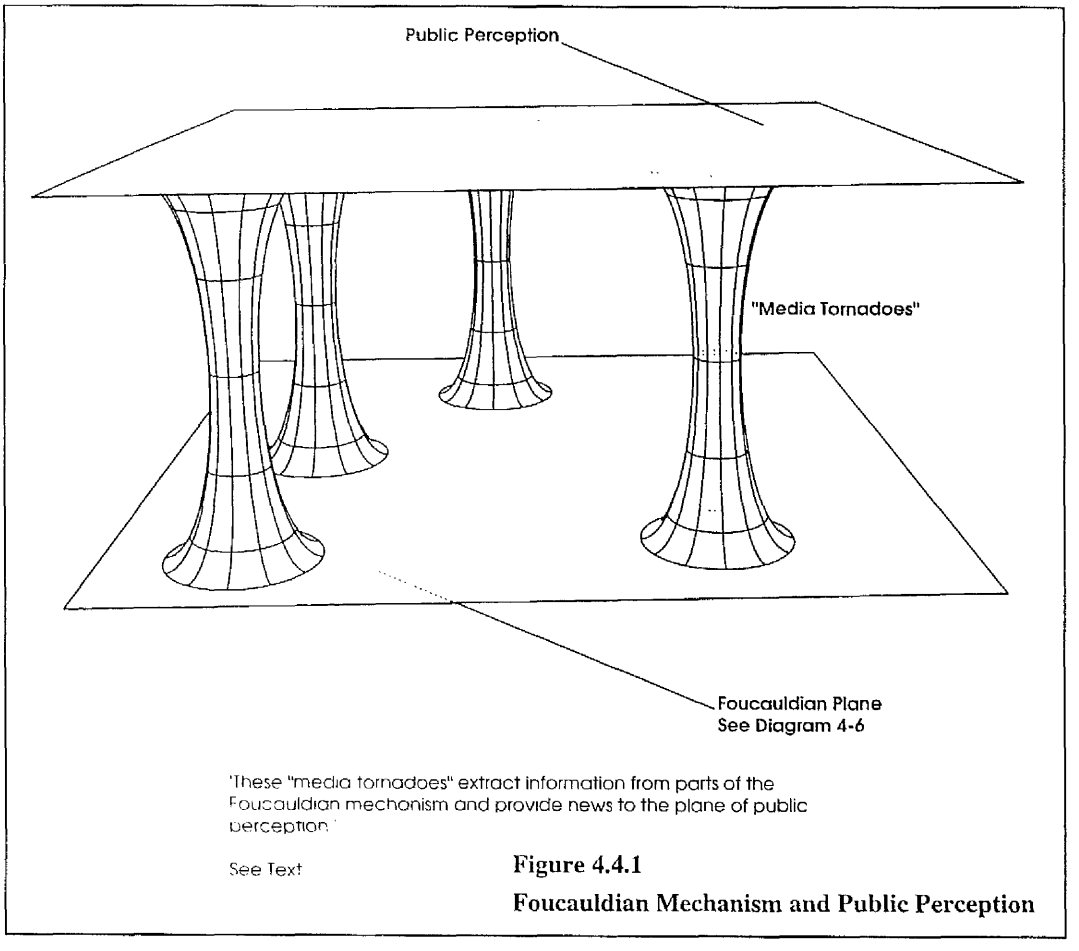


Figure 4.4.1
Foucauldian Mechanism and Public Perception

chapter 3 of this study is an introduction of a plane representing perceptions of the public. The newly introduced plane and figure 4.3.2 depicting the Foucauldian mechanism as another plane form a two-storey structure shown as figure 4.4.1. The two stories are connected, or related, by a number of columns shaped like tornadoes representing reports by media, operations of mass communications. These "media tornadoes" extract information from parts of the Foucauldian mechanism and provide news to the plane of public perceptions. Their function resembles that of searchlights in the dark: searchlights illuminate elements in the dark, and the illuminated elements are perceived as images. Moreover, news and reports by the mass media do not permanently cover the whole of the Foucauldian plane, just as a searchlight used in the dark is only a temporally and spatially limited substitute of the broad daylight. Images are temporal and attenuate perception. Media coverage, however, is not haphazard: media attention follows certain patterns. It can be learnt from Chapter 2 and 3 of this thesis that determinants of such patterns are vague pretences, fantasies, of science, conscience, progress and humanitarian world system. The "media tornadoes", then, emerge and move to transform the Foucauldian self-perpetuation illustrated earlier into fragmented impressions of collective efforts by communities in search of synergistic solutions, a bright future. Figure 4.4.2 illustrates the effect of the "media tornadoes " on the plane of public perceptions.

An important outcome of such "media tornadoes" is to focus public attention on issues such as a war, environment or famine. Public perception and media coverage of events excite each other. Excited public perceptions demand more information from the media; and excited "media tornadoes" start vigorously generating variations of news story with a humanitarian flavour. The positive feedbacks between media and perception result in public attention projected back to the Foucauldian plane. Figure 4.4.3 illustrates this mechanism: The "media tornadoes", which are cut in half for graphical clarity and convenience, hover about on the plane of public perception and maintain impressions of the humanitarian world system. The "informed" public reaches a consensus on a issue, demanding support, pressure or an action for a particular region of the Foucauldian plane, where governments and international organizations operate. At this point, the mechanism of

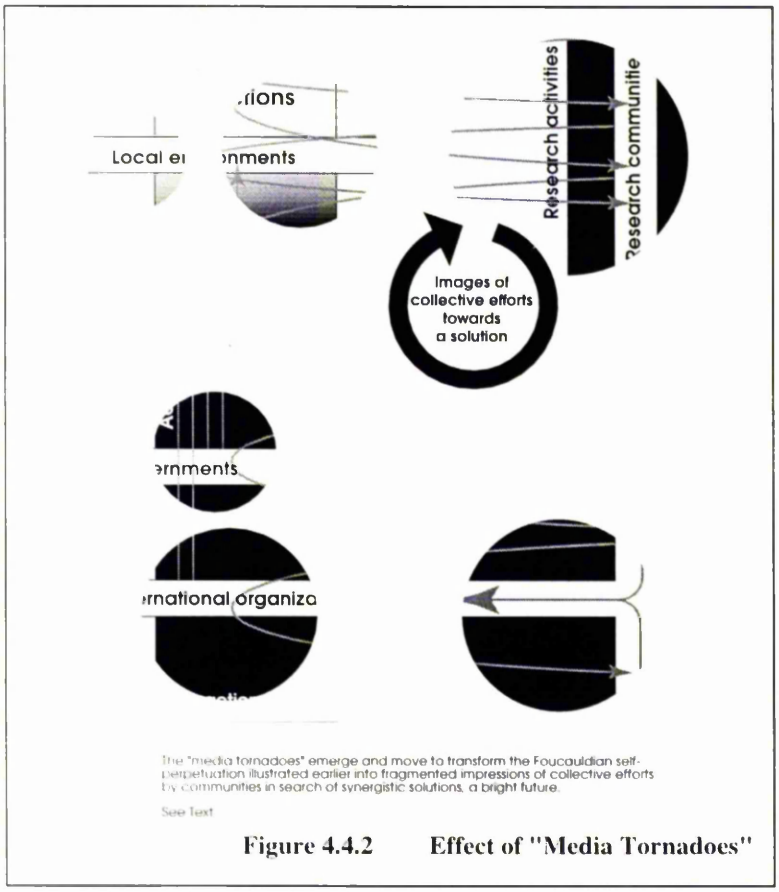


Figure 4.4.2 Effect of "Media Tornadoes"

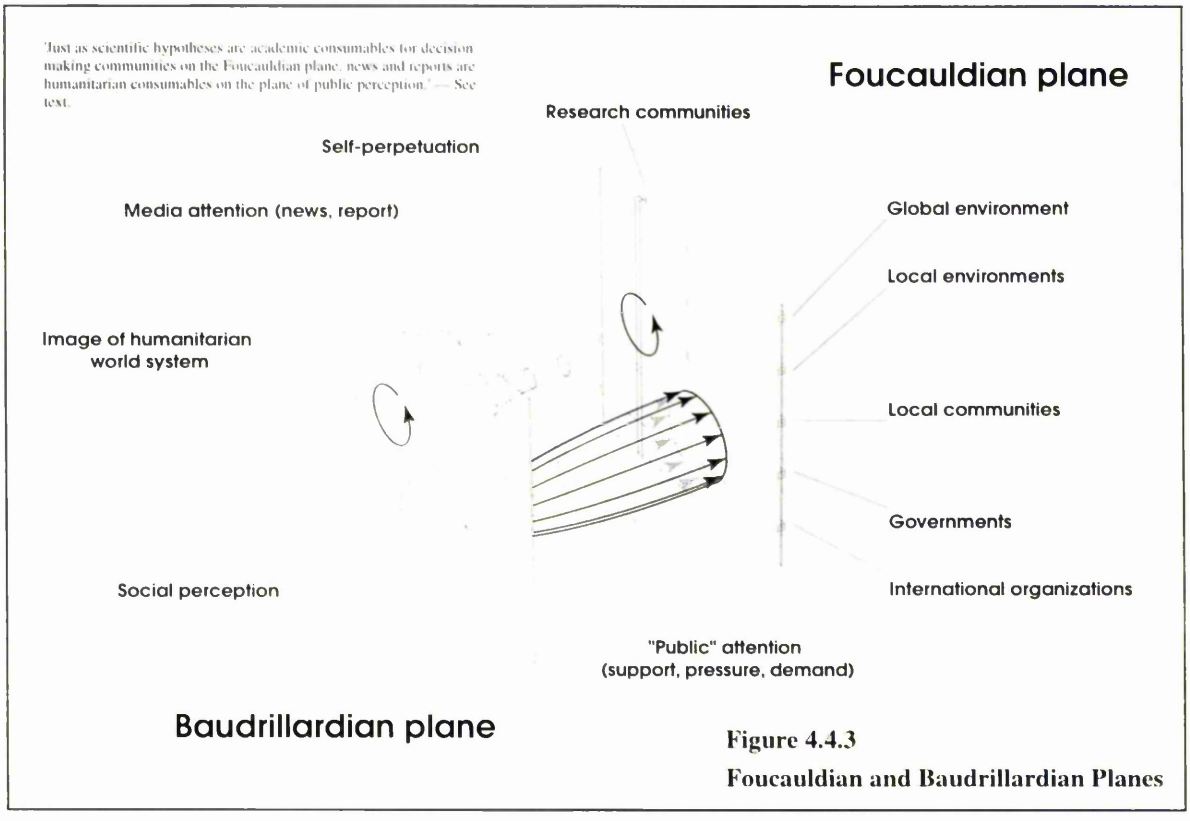


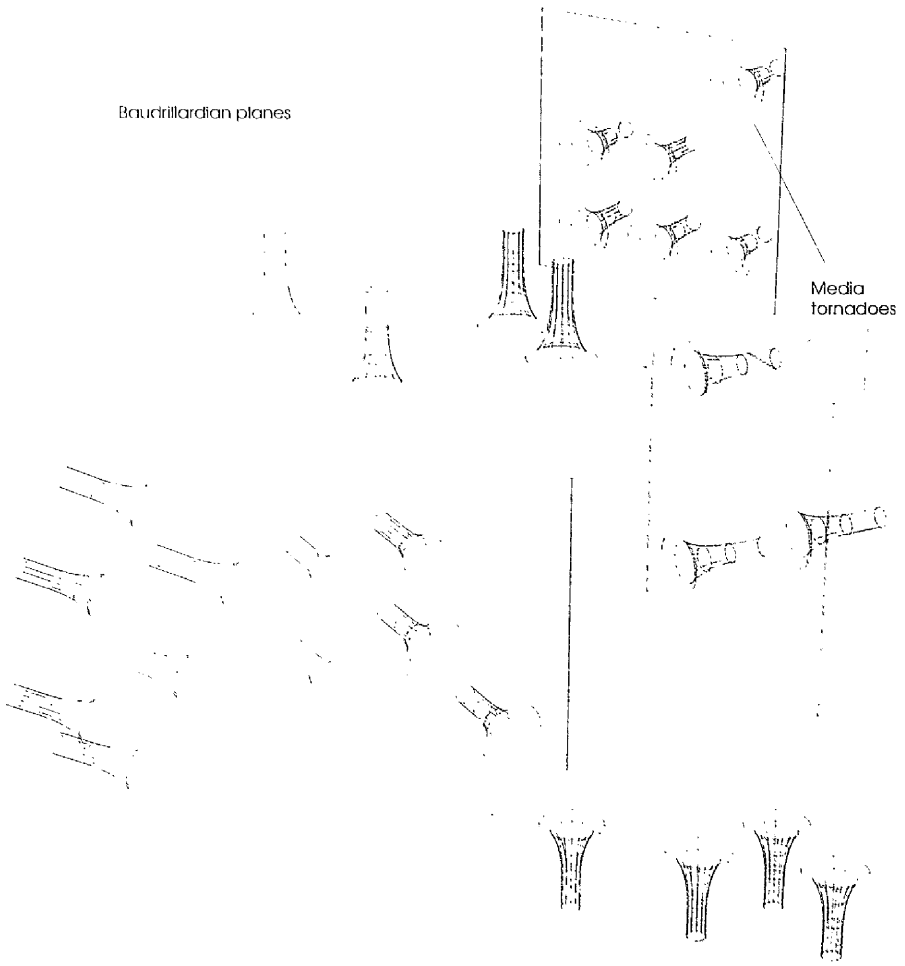
Figure 4.4.3
Foucauldian and Baudrillardian Planes

propaganda discussed in Chapter 3 of this thesis can be well comprehended: artificial manipulation of the "media tornadoes" can invoke particular public support, pressure and demand.

One may argue that the plane of public perception introduced in the figure 4.4.1 is only a magnification of the region between local communities and international organizations in figure 4.3.2, and thus the new plane is a part of the Foucauldian structure. It is a reasonable viewpoint. The definition of propaganda identified in Chapter 3 of this thesis, which is synthesised from definition of propaganda made by Kellner (1992, p6) and that of discourse in mass media made by Fair (1992, p110), is highly Foucauldian in the sense that it refers to 'a structure of meaning (ibid.)' for mobilisation of 'public opinion (Kellner, 1992, p6). It is, however, necessary to pay attention to amount and velocity of information involved in the region of the Foucauldian plane. Does not the multiplication of information through operation of mass media transcend from the Foucauldian genealogy of knowledge? Can the production of variations of news and reports be better understood as process of Baudrillardian simulation in which every piece of information is 'always already reproduced (1983, p146)'? Any piece of Information flowing on the Foucauldian plane is governed by he political economy of truth mentioned in Section 1 of Chapter 2 of this thesis. The characteristic of such information is that they connote a tangent to "reality". Any academic hypothesis tries to demonstrate its persuasiveness as much as possible, and often successfully does so. An example of this is Famines and Poverty by Sen (1981) looked at in section 2 and 4 in Chapter 2 of this thesis. Its solidity of logic and structural clarity have proved to have great appeal, and its central message, the entitlement approach, is considered close to "reality", and a number of actions and decisions have been, and still are, made on the basis of the hypothesis. News, and reports by the mass media, on one hand, also connote that they are the tangents to "reality". On the other hand, they are produced as variations of primary discourses. A clear example of this is the Fair's (1992) observation of the New York Times' coverage of the Ethiopian famine looked at in Chapter 3: The four primary discourses in the newspaper, identified by Fair (ibid.), such as the discourse of aid donors, or of people, could be interwoven easily to mass-produce a large number of packaged discourses just as achieved by the mass media in US during the Persian

Gulf War. Just as scientific hypotheses are academic consumables for decision making communities on the Foucauldian plane, news and reports are humanitarian consumables on the plane of public perception. The difference between the two types of consumables is that while an academic hypothesis can be located as a minor or major branch in the evolution tree of hypotheses, a news story can be only the end of such a branch, a leaf or a flower. In relation to the consideration above, it has to be noticed that individuals taking parts in the self-perpetuation on the Foucauldian plane are also members of the public of which perception is determined by the media coverage of events. The fast flows of large amounts of information, the vast simulation of information, can be placed in the region of the Foucauldian plane, but if they are considered phenomena on another plane, a link between the Foucauldian context and the Baudrillardian context can be found.

The concept of "traffic accidents" of information is of relevance to the analysis of African information. This phenomenon results from contradictions made by excessive media coverage of an event. They are observable through consistent media analysis, and examples are discussed in section 2 of chapter 3 of this study. Recognition of such contradictions in news and reports by mass media leads to an insight into the Foucauldian self-perpetuation underlying impressions of humanitarian world system. The considerations made and the figures introduced so far in this section are based on analyses of such a recognition in section 2 of chapter 3 of the study. An analysis of the 'dark' function of media cannot be, however, anything more than one of a number of plausible accounts. Therefore, its impact on the mechanism of humanitarian cannibalism through the production of news and reports cannot help being limited. As explained in section 3 of chapter 3 of this study, proliferation of information causes only further proliferation of information: excessive amounts of information can only be circumstantial evidence to create a number of convincing stories. In the Baudrillardian 'site of total uncertainty (Baudrillard, 1994, pp41-42)' mentioned in the same section, 't[T]here is nothing to believe (ibid., p42)'. Moreover, in the same site, the Foucauldian mechanism itself, that is the Foucauldian 'political economy of truth', is reduced to yet another discourse of power which is not worth believing in, and thus disappears. Figure 4.4.4 illustrates such neo-Baudrillardian hyper-reality. What this figure shows is endless feed back loops



'Endless feed back loops of information: A number of the Baudrillardian planes facing multiple directions and influence each other.'

'Uses of break-lines, which are for enhancements of third-dimensional perspective in the diagram 4-7 and 4-9, are intentionally avoided in this diagram in order to give optical illusions: A viewer of this diagram is supposed to experience confusion in perceiving how a plane faces others and which direction 'media tornadoes' on a plane are oriented towards.

See text

Figure 4.4.4
Baudrillardian 'Site of Total Uncertainty'

of information. A number of the Baudrillardian planes face in multiple directions and influence each other. Uses of break-lines, which are for enhancements of third-dimensional perspective in figures 4.4.1and 4.4.3, are intentionally avoided in this figure in order to give optical illusions. A viewer of this figure is supposed to experience confusion in perceiving how a plane faces others and which direction 'media tornadoes' on a plane are oriented. The optical effect represents the uncertainty that Baudrillard mentions (ibid.) and the matrix from which "plausible accounts" are made. The circulation of information in the neo-Baudrillardian hyper-reality

differs from the circulation of information, or discourses, in the Foucauldian mechanism shown as figure 4.3.2. Information circulates to maintain the mechanism itself in the latter, but to multiply schismatic uncertainty in the former. The number of planes and the distribution and density of media tornadoes on a plane change from time to time, which increases the uncertainty.

Let us look at the Baudrillardian process which has been considered above from a slightly different angle. The pivot of the discussions of humanitarian consumable produced by mass media made so far in this section is their effect which is to excite the public. Excitement stimulated by images of starving children or degraded environment, which are orchestrated by mass media, function as momentum to generate interests for decision making communities. Of course, public perception is not a plain and innocent ground to be excited by propaganda. There is a complicity between the consumer, the public demanding images of misery, heroes, bright hopes and so on, and the supplier, the mass media. It transforms information from Africa into disaster, or development, pornography. Such humanitarian cannibalism is most clearly observable when excitement caused by it is at the peak, but its nature can be interestingly exhibited in phases of oblivion as well. Benthall (1993, p208), who comes up to the term 'disaster pornography', writes:

> McLuhan said that we swim unwittingly in media as fish are unaware of the element they swim in. It is truer to say that the element in which we Western consumers swim is, in fact, merchandising.

Then, how images of starving children or cheerful developments are treated when they are not regarded as popular commodities in the market? Insiders' views examined by Harrison and Palmer (1986, p138) in their analyses of British mass media is useful to answer this question.

> Although the charters of both the BBC and the Independent Broadcasting Authority stipulate that some current affairs programmes must be shown at prime time, there is a strong tendency to relegate development-type programmes to the late, late hours, or to BBC 2 or Channel 4, or to both. Moreover, television producers, in Peter Grill's experience, have an inbuilt resistance to programmes about the Third World:

> There is a weary and unjustified cynicism about public interest in this issue that is widespread within the media. I think a lot of television producers underestimate the genuine public concern and interest in this area.

It is true that commercial rivalries may have helped to 'sell' the 1984 famine in Ethiopia. As Lloyd Timberlake asserts:

> There's got to be a profit in the story before the media, which really draws attention to things, gets hooked into it. Because the media are really a bunch of competing private guys, it's always haphazard.

But competition is no reason for complacency. If commercial considerations had loomed large in the minds of those at the BBC who decided to 'push' the story, they could equally have conspired to kill it. As Jonathan Dimbleby suggests, the fact that the Amin-Buerk film 'arose out of a series of accidents is a demonstration that one must remain sceptical about any news organisation's compassion or feeling'.

(The Amin-Buerk film mentioned above is the one known as the inspiration for the Band Aid. — H.Y.)

What determines whether a story should be "pushed" or "killed" is not humanitarian compassion or sublime feeling to fulfill a journalistic obligation but commercial considerations. When 'development-type programmes (ibid.)' do not seem fashionable, they are simply taken away from the shelf. Absence of such programmes for a certain length of time may let them regain their "market values". In order to satisfy such revived demands, images of starving children or degraded environment with the same old compositions are sufficient. During periods between these resurrections, local communities and environments in Africa are dead and in oblivion. Certain parts of decision making communities such as aid agencies satisfy their interests through exciting orchestrations of propaganda when the images of Africa are resurrected. When they are dead in oblivion, other parts of decision making communities can gain benefits from acting in other issues orchestrated in mass media.

Benthall (1993, p213) writes:

> Some disasters fall readily into the mould of television consumables, the obverse of its 'light entertainment'. Others are ignored. But those which are recognised may as readily be dropped. What happens to politicians or entertainers can easily happen to groups of sufferers, that is to say they are forgotten. An actor is 'type-cast' and ceases to get parts. Fashion moves on. The Kurds, the Cambodian, the Ethiopians are forgotten.

Sufferers are to be forgotten and revived. They are, like zombies, neither alive nor dead. Meanings of information about the zombies, which are conveyed by the mass media, are destined to void after all. There are news and reports about local communities and environments in Africa. Information in them have only a momentary life span. They may consist of thousands of words, photographs and video clips, but the only asset that they can never have is a meaning. Any critical analysis on this mechanism cannot have an impact on it. This is the Baudrillardian stalemate.

4.5 Possibility of breakthrough from the two stalemates

Although the efforts made so far in this chapter do not indicate an obvious breakthrough from the Foucauldian and Baudrillardian mazes of information, topological mapping of the mode of information, which is proposed in Chapter 1 of this thesis, can be completed by utilising the figures produced, and, from that point, an attempt can be made to seek tactics to counter the vagaries of Foucauldian and Baudrillardian thoughts.

The three figures, 4.3.2, 4.4.3 and 4.4.4 are most important among the ten figures included in this chapter. Figure 4.3.2 is neo-Foucauldian, 4.4.3 transitional between the Foucauldian and the Baudrillardian concepts, and 4.4.4 neo-Baudrillardian. As discussed before, any attempt to induce a change to the prevailing mode of information would encounter a stalemate. It is interesting to compare the Foucauldian stalemate which can be

encountered in the circumstance of the figure 4.3.2 and the Baudrillardian stalemate in the circumstance of figure 4.4.4. These two stalemates are of profound significance to the study of information related to Africa.

The two stalemates are indeed variations of the Epimenidean paradox explained in Section 1 of Chapter 1 of this study. When one says that there is no truth in the world, is the statement itself truth? Whether it is or it not, the Epimenidean paradox emerges. Baudrillard suggested to 'f[F]orget Foucault' to escape from the Foucauldian stalemate where power as network of consensus comes into existence from the absence of truth. Then, what suggestion can be made to escape from the Baudrillardian stalemate where information is saturated and there are only symptoms and speculations but not truth? Baudrillard (1995, pp66-67) writes:

> Resist the probability of any image or information whatever. Be more virtual than events themselves, do not seek to re-establish the truth, we do not have the means, but do not be duped, and to that end re-immerse the war and all information in the virtuality from whence they come. Turn deterrence back against itself. Be meteorologically sensitive to stupidity.

Interestingly, this idea reminds us of the Foucault's remark (Baudrillard, 1987, p65) mentioned in the fourth section of the first chapter of this thesis.

> 'As in judo, the best answer to an adversary manoeuvre is not to retreat, but to go along with it, turning it to one's own advantage, as a resting point for the next phase.'

The above two suggestions give an impression of similarity. The two thinkers seem to consider that to stay and hold with wide open eyes is the strategy to adopt, and possibly thereby to escape from, the stalemates. The similarity originates from the circumstances that both Foucault and Baudrillard had to face in variations of the Epimenidean paradox at the ends of their analyses. Understanding this context, it has to be recognised that the above two sets of advice are directed towards each individual not as a member of a community or the public. It is not for a person as a member of an institution, an organization, a society or "the public" but for a person as an individual human being. Then, the two sets of advice can be understood with more precision: they are about the

attitude that an individual should take to resist the Foucauldian or Baudrillardian mode of information. The remaining question is whether or not it is possible to escape from the Foucauldian and Baudrillardian stalemates by deploying such an attitude.

At this point, a revisit to the discussion made in relation to Kellner's critique (1989) on Baudrillard in Section 3 of Chapter 1 becomes meaningful. Kellner thinks that 'multiplicity of perspectives' gained from combination of Foucauldian and Baudrillardian thoughts would be useful in any analysis of 'the phenomena and dynamics in our current social situation (1989, p141)'. This notion is examined in the following part of Chapter 1 and concrete examples are applied to the basic concepts in Chapter 2 and 3. It is indeed possible to regard figure 4.3.2 as the elaboration of the first set of domains shown in figure 1.2.1, figure 4.4.4 as the second set of domains shown in figure 1.2.2, and figure 4.4.3 as the third set of domains shown in figure 1.2.3. A crucial question to be raised here is whether:

1) An individual should find his / her specific position in one specific figure among the three; or

2) An individual should find contexts to locate him / her in each of the figures.

The discussion following the mention to Kellner (ibid.), which was made in Section 3 of Chapter 1, recommends the second option. To consider "which option is the best" is pointless as the velocity of information flows vary, and every individual has the possibility to be exposed to both the Foucauldian and the Baudrillardian mode of information. By detecting contexts which determine his / her position in each of the three figures, the three different modes of information, an individual may be able to take advantage of discrepancies among them. This possibility is essentially deployment of propaganda at the level of the individual. In the Foucauldian mode of information, as illustrated by figure 4.3.2, hypotheses academically produced are transformed into discourses which form networks of consensus, and then into actions which induce new hypotheses. The self-perpetuation of information absorbs any attempt, which is the Foucauldian stalemate discussed at the end of Section 6 of Chapter 2. In the Baudrillardian mode of information, as illustrated by figure 4.4.4, plausible accounts formed by media reports remain plausible accounts. The

uncertainty sets any account in the Baudrillardian stalemate discussed at the end of section 3 of Chapter 3. What can be noticed here is that there might be room for individuals to manoeuvre between the two stalemates. It might be possible for individuals to set the Foucauldian stalemate against the Baudrillardian stalemate, and vice versa. Individuals might be able to find a breakthrough if a discourse in the Foucauldian mechanism is soaked into the uncertainty of the Baudrillardian plane, or if a plausible account on the Baudrillardian plane is fed to the self-perpetuation of the Foucauldian plane. A discourse adversary to an individual on the Foucauldian plane can be reduced to one of plausible accounts on the Baudrillardian plane through proliferation of information, and a merely plausible account on the Baudrillardian plane can be transformed into a discourse to strike a blind spot, or absence, of network of consensus on the Foucauldian plane through the organisation and presentation of information. It is worth remembering that although the alternative view presented by Kellner (1992), McLean (1993) or Fair (1992) is not more than an hypothesis amongst other plausible accounts, the proliferating assumptions could make all pieces of information relative to each other by drowning dominant "packaged" discourses in the 'site of total uncertainty (Baudrillard, 1994, pp41-42)'. By having multiple perspectives consisting of the different modes of information, an individual may acquire a temporary exit from the Baudrillardian and Foucauldian stalemates. Questions to be raised at this point are:

1) How can the Foucauldian and Baudrillardian flows of information be reversed?; and

2) What motivates an individual to take such an action?

These questions shall be considered in depth in the following two chapters. Answers to these questions need to be made in relation to positions of individuals, their positions in the different modes of information: an individual can only be motivated by the type of information to which he / she is exposed, and the type of information available to him / her is determined by the community to which he / she belongs.

Communities consist of individuals. The discussions made so far in this section do not clearly differentiate communities, and hence individuals, by their positions. They could be at the heart of the Foucauldian mechanism and Baudrillardian site of total uncertainty, or on their periphery. The discussion made so far in this

chapter was focused on the essential effects of the Foucauldian and Baudrillardian information flows but not much on the lives of individuals facing forces outside of those information flows. Therefore, the implications made so far can be contrasted with the circumstances of local communities at the edge of the Foucauldian networks of consensus and Baudrillardian saturation of information. An insightful Kenyan journalist, Ochieng (1992, p107), writes:

> Now the low level of education and training on the part of the majority of those in the newsrooms of Africa's newspapers, and the consequent fact that what they produce — what passes as news in the pages of those newspapers — is platitudinous, unresearched and mystifying is a reflection of the general condition of illiteracy throughout our continent. Contrary to a local popular myth, Kenya has an illiteracy rate far higher than that of Tanzania. It was to this fact that a newspaper reader referred when he defended The Nation against Kibaki in a letter published in that paper on 27 October 1977. Seeming to say that newsmen should not struggle to sharpen their tools, A.B. Agwambo said that there was no need for writing researched economic analyses since the majority of the people are illiterate and cannot understand such analyses.
>
> He wrote: "...The majority of Africans are illiterate. In which case they do not need deeply researched economic and financial commentaries..." Yet this obviously false conclusion by Agwambo was based on a perfect truth: "The lack of information may not squarely be blamed on the writer. It ... is a feature of [our under]development in that we still lack facilities of quick research and readily available information such as computerised records..." In other words, our technological underdevelopment is itself the principal chain fettering all our freedoms. The main feature of our backwardness is the relative absence in our countries of basic information on nature and society, an absence whose mode of existence is our lack of trained people and proper technology with which to exploit our own natural environment and live an independent and increasingly free life.

In Ochieng's view (1992, p110), 'our freedoms (ibid.)' are defined as follows:

> Freedom is social independence in the process of creating information and technology from our daily interaction with nature, in the form of industry, agriculture and scientific researches, to wrest from nature all our means of survival in all areas of society. Those who swear that freedom means merely the liberty to cast votes or to print trivialities in newspapers (when those newspapers do not reach 75 per cent of the people) only display their astounding ignorance.

Proposal of Ochieng (1992, p110) for the status quo in Africa is straightforward:

> Let us not assume the defeatist attitude that our people are illiterate and, therefore, do not need information: surely, information is the answer to ignorance and illiteracy, and our manifest duty as literate members of society is to awaken the sleeping majority of our brothers and sisters in every way available to us. We must give deep economic and financial analyses at least to the few who can understand them, so that they, in their turn, can impart that knowledge to more and more people so as we move along on the path of intellectual liberation. Anything which contributes even an iota to our final economic, technological and cultural emancipation is clearly better than nothing. Let us bag every little gain we can make in the tactical arena as we fight on towards our more strategic aims. Let us reject the all-or-nothingism of Samir Amin and the other "neo-Marxists" for whom no gainful use can be made of foreign-owned newspapers and other industries.

It has to be noticed that what Ochieng (ibid.) suggests is not promotion of any particular discourse as in majority of the papers in the proceeding of the 8th Biennial Conference of the African Council for Communication Education (ed. Boafo, 1993) mentioned in the previous chapter, but promotion of an approach which increases available information for the uneducated and the illiterate in African countries. What Ochieng (1992, p110) proposes might be considered yet another discourse based on 'a line of objective progress (Baudrillard, 1994, p70) in which 'everyone is supposed to pass through various stages (ibid.)' , similar to

'evolutionism which unilaterally sanctions the superiority of the human race (ibid.)", but is not. Ochieng's (1992, p110) argument is about the generation of knowledge. It is an argument to lay a matrix to enable an individual to produce his or her own discourses, to seek for what to believe, but not to lead people to believe a discourse externally produced. Ochieng (ibid.) recommends that use be made of 'foreign-owned newspapers and other industries', but not to be used by them.

It has to be realised at this point that what Ochieng (ibid.) arguing for is not a hypothesis but truth for himself and his people. Ochieng (ibid.) does have something to believe while Kellner (1992), McLean (1993) and Fair (1992) would have to admit that their alternative views are only hypotheses after all. This difference is because Ochieng (1992, p110) himself and his 'brothers and sisters (ibid.)' directly face the illiteracy and limitation of available information in their daily lives, but the Gulf War had to be transformed into a domestic issue for viewers in the North according to Kellner (1992). The environment or famine in Africa is only a subject to study for McLean (1993) and Fair (1992) in the "developed" world. Everyday life, and the future, of Ochieng (ibid.) and his people depends on increasing available information but not on the promotion of the increase of available information. The political popularity of a politician, the professional career of an administrator, the corporate survival of an NGO, the academic standing of a researcher, the humanitarian satisfaction of the public in the "developed" world is related to the promotion of an increase in the available information but not necessarily to the actual increase of available information in Africa. A simplistic, or conventional, understanding is that the promotion of a policy is a necessary measure to bring about the intended effect, but it has to be noted that such a measure often, or always, becomes the objective, the goal or the end in the Foucauldian mechanism as well as in the Baudrillardian site of total uncertainty. The position of Ochieng (1992, p110) and his people is different from that of any researcher, any politician or any individual in the "developed world". An individual can possess belief only for what he / she directly faces, and only such a belief creates reality.

Chapter 5: Communication Networks for Africa

> The information revolution sets in motion forces that challenge the design of many institutions. It disrupts and erodes the hierarchies around which institutions are normally designed. It diffuses and redistributes power, often to the benefit of weaker, smaller actors. It crosses borders, redraws the boundaries of offices and responsibilities, and generally compels closed systems to open up.
>
> The lesson: Institutions can be defeated by networks, and it may take networks to counter networks. The future may belong to whoever masters the network form.
>
> (Originally from "CYBERWAR IS COMING!" in Comparative Strategy, Vol. 12, No. 2, 1993, pp. 141-165.
> Retrieved from http://gopher.well.sf.ca.us:70/0/Military/cyberwar.
> — The latest confirmation of existence of this text was checked on April 4, 1998. H.Y.)

5.1 Introduction

The objective of this chapter is to consider the possibility of, and the necessity to, change the context in which geographical information is conventionally deployed for communities concerned with Africa. The change to be achieved is from the conventional function of geographical information, an institutional tool to manipulate environments and communities, to a more dynamic state, an autonomous process consisting of interactions among individuals, communities and organizations. Then, how can an individual take a part in geographical information as a process to counter a theory, model or decision produced by an institution, organization or government? If an answer can be offered to this question, then it may become possible to change the context of geographical information. To start with, the following viewpoints for a theory, model, concept, policy, decision and action are useful:

1. Whose benefit is geographical information or an action supposed to support?
2. Whose benefit does it serve?
3. Who is pleased by it?
4. Whose benefit is served by those who are pleased?; and

5. What do those benefits mean to an individual?

Exact answers to the above questions would differ from one case to another, but discussions made so far in this study offer a foundation for consideration. Clues to answer the first and second questions in a specific case can be obtained from the Foucauldian approach demonstrated in Chapter 2 of this study. The people whose benefit is supposed to be supported by famine early warning system or policies and actions to ameliorate drought and "desertification" in Africa are vulnerable local communities in the continent. Those actions and decisions, as well as theories, models and concepts on which they are based on, however, essentially support benefits of decision making and research communities. Clues to answer the third and fourth questions in a specific case can be obtained from the Baudrillardian approach demonstrated in Chapter 3.

News of "African events" such as famine and their consequent aid operations on TV and newspapers are essentially consumables with a humanitarian flavour for their audiences and readers. Reports from those mass media are not rootless not just in the sense that their materials are collected from "real" fields in Africa or interviews with senior decision makers, but, more importantly, in the sense that they are "mass-produced" from the same matrices such as humanitarianism or neo-liberalism from which academic theories, models, interpretations and concepts as well as decisions, policies and actions are originated.

In short, audiences and readers of mass media are pleased by such discourses decorated by placenames and other proper nouns. The interests of research communities and decision making communities are often well supported by the public, the recipients of the humanitarian pleasures taking forms of news and reports on TV and newspapers, which can be termed operations of propaganda.

Clues to answer the fifth question, the interests of the individual, in a specific case can be obtained from the discussion in Chapters 3 and 4. Mass production of news, variations of the same discourse with only different decorations, transcends the subtle and significant complicity among research and decision making communities

and mass media employing geographical information presented in various forms and styles as a tool to manipulate perceptions of the public. Geographical information of, or related to, Africa delivered to the public by the mass media contributes to the 'critical mass for implosion of meaning' in which the significance of African events such as famines and droughts themselves disappear, and only the illusion of simplified and allegorised combination of tragedies and of humanitarian efforts for Africa come into existence. What those interests mentioned in the previous questions brings to an individual outside of Africa is, then, fixation of the continent as a permanent adventure playground. It is the birth of a closed world excluded from, or subjected to various interests of, its outside. This understanding, however, could lead to a completely opposite notion. An individual either inside or outside of Africa can still refuse to be dissolved into the above composition just as those who call themselves Zapatista are managing to do in Mexico. Let us see the Mexican case with special attention to the five questions above to find implications for Africa.

In this chapter, the possibility to convert geographical information from academic and humanitarian consumables to processes in which one individual informs his / her circumstance to another is considered. The activities of the Zapatista provide examples of how new international IT networks enable previously 'marginalised' communities to wage a struggle against the Foucauldian and Baudrillardian mechanisms. Contrary to popular belief, developments of IT infrastructures in Africa are not entirely hopeless, and there might be chances for individuals to take advantages of the Internet to counter conventional flows of information which are pulling local communities of Africa towards the emerging Fourth World consisting of multiple black holes of social exclusion as pointed out by Castells (1998, p164). This chapter implies the following two points. One of those is that obstacles to IT infrastructure developments in Africa need to be monitored and publicly discussed. The other is that geographical information products need to be designed as a catalyst for different perceptions held by different communities as well as to support discourses for IT infrastructure developments in Africa.

5.2 The Zapatista

Actions taken by the Zapatista can be looked at from a large number of viewpoints. In this section, their background and two very remarkable episodes which are most relevant to the purpose of this chapter shall be observed in relation to the five questions mentioned in the previous section. Let us first look at its origin, situation and objective. The Zapatista consists of peasants, or so-called American Indians, tzeltales, tzotziles, and choles, living in and around the Lacandon rain forest in the state of Chiapas in Southern Mexico. About 3,000 lightly armed people, took control of the main towns around their home forest on January 1, 1994, the very first day of the North American Free Trade Agreement, NAFTA (Castells, 1997, p73). Chomsky (1993) criticises NAFTA in the following context.

> Structures of governance have tended to coalesce around economic power. The process continues. In the London Financial Times, James Morgan describes the "de facto world government" that is taking shape in the "new imperial age": the I.M.F., World Bank, Group of 7 industrialized nations, General Agreement on Tariffs and Trade (GATT) and other institutions designed to serve the interests of transnational corporations, banks and investment firms.
>
> One valuable feature of these institutions is their immunity from popular influence. Elite hostility to democracy is deep-rooted, understandably, but there has been a spectrum of opinion. At the "progressive" end, Walter Lippmann argued that "the public must be put in its place," so that the "responsible men" may rule without interference from "ignorant and meddlesome outsiders" whose "function" is to be only "interested spectators of action," periodically selecting members of the leadership class in elections, then returning to their private concerns. The statist reactionaries called "conservatives" typically take a harsher line, rejecting even the spectator role. Hence the appeal to the Reaganites of clandestine operations, censorship and other measures to insure that a powerful and interventionist state will not be troubled by the rabble. The "new

imperial age" marks a shift toward the reactionary end of the antidemocratic spectrum.

It is within this framework that the North American Free Trade Agreement (NAFTA) and GATT should be understood. Note first that such agreements have only a limited relation to free trade. One primary U.S. objective is increased protection for "intellectual property," including software, patents for seeds and drugs, and so on. The U.S. International Trade Commission estimates that American companies stand to gain $61 billion a year from the Third World if U.S. protectionist demands are satisfied at GATT (as they are in NAFTA), at a cost to the South that will dwarf the current huge flow of debt-service capital from South to North. Such measures are designed to insure that U.S.-based corporations control the technology of the future, including biotechnology, which, it is hoped, will allow protected private enterprise to control health, agriculture and the means of life generally, locking the poor majority into dependence and hopelessness.

(Originally from "Notes of NAFTA: "The Masters of Man" in The Nation 1993. Retrieved from http://www.worldmedia.com/archive/articles/9303-nation-nafta.html. — The latest confirmation of existence of this text was checked on April 4, 1998. H.Y.)

In an interview broadcasted by WRCT Pittsburgh in 1994, Chomsky made insightful remarks on the mechanism behind of NAFTA and the insurgency in Chiapas.

Endres: Sure. If you hadn't read the New York Times, or any of the papers that follow its agenda, you would see that that's what NAFTA is about. But of course all the coverage was to tell about all the wonderful things that it was going to do for us.

Chomsky: It'll do wonderful things for a sector of the population. In fact, if you really look closely, they even tell you who they are. The day after the vote on NAFTA, which of course the press was highly enthusiastic for since it was a big business thing, the

day after the vote, the New York Times published its first analysis of the effect on the New York region. And it was quite illuminating, not that it was a surprise, but it was interesting to see them say it. They were very upbeat; they said it was going to be great. And then they told you who the gainers would be, and who the losers would be. Well, it turns out the gainers would be banks, investors, corporate lawyers, public relations firms, you know, that kind of stuff. And the losers — there was about a sentence on the losers — among the losers they said would be women, blacks, Hispanics, and semi-skilled workers. Semi-skilled workers is about 75% of the workforce.

Endres: Me, in other words.

Chomsky: The population. They're the losers. But the right guys, they'll be doing great. So therefore it was very upbeat. And that's exactly correct. These are social policies which are designed to increase polarization. Very likely to have the same effect in Mexico.

Endres: What does the uprising in Chiapas — in the southernmost and poorest state of Mexico — what does that have to tell us about NAFTA?

Chomsky: A lot.

Chomsky: ....The Chiapas uprising was timed for the day of the beginning of NAFTA; that

was symbolic. Not because their problems start with NAFTA, but because they describe NAFTA as a "death sentence" for the indigenous populations and in fact for the poor generally. And the Chiapas revolt had enormous support within Mexico. The Mexican government backed off from just destroying it by violence because there was just too much popular support. Polls showed about 75% support. Which is not surprising, because this "economic miracle" in Mexico that everyone raves about left out about 85% of the population — not only left them out, but they declined in absolute terms during the period of the "miracle."

Endres: That's standard.

Chomsky: Yeah, that's exactly what these policies are designed for. But we only talk about the rich guys, and they did fine, so it's a miracle.

Compare Chiapas to South Central Los Angeles a couple of years ago, the uprising there. In a sense, they were about the same thing. They were about the social policies which are marginalizing and making superfluous a huge part of the population. South Central Los Angeles is an area where people used to have jobs. There were industries, there were furniture factories, heavy industry. Well, they've gone to places where you can get cheaper labor and you don't have to worry about the environment. So these people are essentially useless. They have no human rights any more because they don't contribute to wealth production. And they're just declining.

Well, Chiapas is a similar situation. Of course, Chiapas is objectively, much poorer

— fewer television sets and bathtubs and so on. On the other hand, it's striking that in Chiapas, one of the most impoverished sectors of the hemisphere, there is still a lively, vibrant society, which has a cultural tradition of freedom and social organization. So they were able to respond in a highly constructive way. They were able to organize, they have positions, they have public support.

[This interview was recorded at the studios of WRCT Pittsburgh on the morning of March 9, 1994. This transcription appeared in the March 23 issue of the Student Union (Carnegie Mellon University). This interview was broadcast on "Eyes Wide Open" (WRCT Pittsburgh) on March 15 and 22. Noam Chomsky and WRCT Pittsburgh release this document into the public domain. You may copy and distribute it on a not-for-profit basis provided that this notice remains.]

(Retrieved from http://www.worldmedia.com/archive/interviews/9403-wrct.html. — The latest confirmation of existence of this text was checked on April 4, 1998. H.Y.)

What was the objective(s) of the insurgency in Chiapas? Castells (ibid., p77) summarises it in two points by referring to a comment made by the Subcommander Marcos, an urban intellectual who studied and taught sociology and communication at universities in Mexico and Paris, and is a spokesperson of Zapatista since the beginning of their actions.

On the one hand, they place themselves in historical continuity with five hundred years of struggle against colonization and oppression. Indeed, the turning point of the peasant movement was the massive demonstration in San Cristobal des las Casas on October 12, 1992, protesting the fifth centenary of the Spanish conquest of America by destroying the statue of Chiapas' conqueror, Diego de Mazariegos. On the other hand, they see the reincarnation of this oppression in the current form of the new global order: NAFTA, and the liberalizing reforms undertaken by president Salinas, which fail to include peasants and Indians in the modernization process. The

changes in the historic article 27 of the Mexican Constitution, which had given formal satisfaction to the demands of agrarian revolutionaries championed by Emiliano Zapata, became the symbol of the exclusion of peasant communities by the new order of free traders. To this critique, shared by the whole movement, Marcos and others added their own challenge to the new global order: the projection of the socialist revolutionary dream beyond the end of communism and the demise of guerrilla movements in Central America. As Marcos wrote with irony:

> There is nothing to fight for any longer. Socialism is dead. Long life to conformism, to reform, to modernity, to capitalism and to all kinds of cruel etceteras. Let's be reasonable. That nothing happens in the city, or in the countryside, that everything continues the same. Socialism is dead. Long life to capital. Radio, press, and television repeat it. Some socialists, now reasonably repentant, also repeat the same.

Thus, the Zapatistas' opposition to the new global order is twofold: they fight against the exclusionary consequences of economic modernization; but they also challenge the inevitability of a new geopolitical order under which capitalism becomes universally accepted.

What has to be noted is that those men and women of the Zapatista were an insignificant factor in the new global order. Their existence could have been easily suppressed by the far greater world system employing more trained military force. In fact, the lightly armed 3,000 Zapatista simply withdrew to their rainforest when the reinforced Mexican Army attacked (ibid.). The insignificant, however managed to become the significant. The following two episodes took place as they employed highly effective tactics from their own forest.

One of the two episodes can be, with irony, as titled the backfiring of 'cruel etceteras'. The method that the

insignificant Zapatista adopted to make themselves significant was not terrorism to be shown on TV as an entertainment but communications between themselves and outsiders. At this point, it is crucial to note that the Zapatista needed a method of mass communication which was very different from conventional modes. As Marcos noticed, radio, press and television would only repeat the underlying message, 'Long life to conformism (ibid.)', with which the Zapatista could not help being marginalised. They, however, adapted to the Internet. Their adaptation to the Internet induced many outsiders who had not been previously exposed to or interested in the insignificant people in the insignificant corner of Mexico. The backfiring of 'cruel etceteras' was first ignited in such autonomous networks of outsiders. The following text in the WWW server at the University of Texas concisely summarised the episode:

> The Infamous Chase Report
>
> One of the most interesting and effective examples of the use of The Net in the struggle against the Mexican government's repressive actions in Chiapas occurred in reaction to the discovery of a report written for Chase Emerging Markets clients by Riordan Roett. Originally leaked to Ken Silverstein and Alexander Cockburn's newsletter Counterpunch, Roett's report was discovered to call for the Mexican government to "eliminate" the Zapatistas in order to demonstrate its command over the internal situation in Mexico. When their story about this report, and then the report itself, was uploaded to The Net it reached a huge audience. It caught the attention of Republican and Perot opponents of the Clinton Administration's financial bailout of Mexico and of large numbers of Mexicans who were furious about what they saw as a Wall Street hand behind Zedillo's February 1995 military offensive against the Zapatistas. News of the report circulated to France and elsewhere. The result was much agitation and mobilization against both Chase and the Mexican government —mobilization which led Chase to fire Roett and which helped

> force the Mexican government to halt its offensive in Chiapas. All this as the result of one small act of "guerrilla research" which revealed the inside thinking of a major American bank with extensive interests in Mexico. The postings which have been collected here trace the emergence, development and denouement of this event.
>
> (Retrieved from http://www.eco.utexas.edu/faculty/Cleaver/chiapas95.html.
>
> — The latest confirmation of existence of this text was checkedon April 4, 1998. H.Y.)

The Internet functions as a field in which to exchange information as well as a facility for archiving. Actions by the autonomous network of outsiders who happened to notice the "insignificant" event, the insurgency of the Zapatista, included setting up of a mailing list service named 'Chiapas 95' — a type of electronic mail service in which any individual with an electronic mail address can subscribe up-to-date news of the region in Mexico. As the above text explains, the same WWW server at University of Texas opens the archived actual communications among people through the mailing list service during the "event" to the public. An enlightening finishing touch to this episode may be the fact that 'The Net (Internet)' in Spanish, La Neta, also means, in Mexican slang, 'the real story' (Castells, 1997, p80).

The other episode was the 'popular consultation' carried out by the Zapatista and their supporters. Castells (1997, pp 81-82) illustrates its context as follows.

> The presidential elections of August 1994 were reasonably clean, giving Zedillo, an obscure PRI candidate brought into the limelight by accidental circumstances, a triumph fuelled by fear of the unknown. Ironically, political reforms in the election process, partly as a result of Zapatista pressure, contributed to the legitimacy of the election, after the agreement on January 27, 1994 between all presidential candidates. The leftist opposition party, whose leader had been rebuffed by the Zapatista, suffered electorally for having sought Marcos' support. In August 1994, the Zapatista called a National Democratic

Convention in a site of the Lacandon Forest that they named Aguascalientes, the name of the historic site where, in 1915, revolutionary leaders (Villa, Zapata, Orozco) met to establish the Revolutionary Convention. In spite of massive participation from grassroots organizations, leftist parties, intellectuals, and media, Aguascalientes exhausted itself in the symbolism of the event, this ephemeral gathering being unable to translate the new Zapatista language into conventional, left politics. Thus, in May 1995, in the midst of protracted negotiations with the government in San Andres Larrainzar, the Zapatistas organized a popular consultation on the possibility of becoming a civilian political force.

It should be noticed that the method taken by the Zapatista to counter the unfavourable development, or stagnation, of the situation was not conventional: They *asked* the public whether or not they should make themselves legally legitimate. The actual questionnaire that they distributed consisted of the following six questions.

EZLN International Plebiscite EZLN

Zapatista National Liberation Army

1. Do you agree that the principal demands of the Mexican people are land, housing, jobs, food, health, education, culture, information, independence, democracy, liberty, justice, peace, security, combat of corruption, and defence of the environment?

Yes ( ) No ( ) I don't know ( )

2. Should the different democratizing forces [in Mexico] unite in a citizens broad-based political and social opposition front and struggle for the 16 principal

demands [listed in question number 1]?

Yes ( ) No ( ) I don't know ( )

3. Should Mexicans carry out a profound political reform which would guarantee democracy? (Respect for the vote, reliable voter registration, impartial and autonomous electoral organizations, guarantee the participation of citizens, including those not members of political parties, as well as non-governmental organizations, recognition of all the political forces, be they national, regional or local)

Yes ( ) No ( ) I don't know ( )

4. Should the EZLN convert itself in a new and independent political force, without joining other political organizations?

Yes ( ) No ( ) I don't know ( )

5. Should the EZLN join with other organizations and together form a new political organization?

Yes ( ) No ( ) I don't know ( )

6. Should the presence and equal participation of women be guaranteed in all positions of representation and responsibility in civil organizations and in the government?

Yes ( ) No ( ) I don't know ( )

Optional, but helpful, information about yourself:

Name:_____

Age:_____

Gender: Male ( ) Female ( )

Occupation:_____

Country you live in:_____

(Retrieved from http://lanic.utexas.edu/la/region/news/arc/lasnet/1995/0615.html.

— The latest confirmation of existence of this text was checked on April 4, 1998. H.Y.)

The Zapatista also accepted entries to this ballot through electronic mail, which enabled non-Mexicans from all over the world to take a part. After all, nearly two million people in Mexico participated in this event (Castells, 1997 p82), and approximately 82 thousands internationally from Australia, Austria, Argentina, Bosnia, Bulgaria, Belgium, Brazil, Belize, Costa Rica, Canada, Colombia, Cuba, Chile, China, Cyprus, Denmark, El Salvador, Scotland, Spain, USA, Finland, France, Guatemala, Greece, Holland, Honduras, Hong Kong, England, Iceland, Ireland, Israel, Italy, Japan, Nicaragua, Norway, New Zealand, South Africa, Sweden, Switzerland, Dominican Republic, Russia, Panama, Puerto Rico, Uruguay, and Peru (gopher://mundo.eco.utexas.edu:70/0R6603-13145-/mailmg/chiapas95.archive/EZLN%20Communiques/1995.09%20%28September%29). The Zapatista publicly announced the results in their communique, but perhaps it was not important. What was significant was the fact that they took the unconventional action conveying the following message:

To the government's violence, the EZLN responded with the dialogue. To the government's intolerance, the EZLN responded with calls for inclusion. To the government's war, the EZLN responded with a search for a peace with justice and dignity. The national plebiscite is the reiteration of the obvious: the commitment to peace is on the side of the EZLN, the interest in war is on the side of the government.

— From an EZLN Communique dated August 27, 1995

(Retrieved from gopher://mundo.eco.utexas.edu:70/0R192419-197292-/mailing/chiapas95.archive/EZLN%20Communiques/1995.08%20%28August%29.

— The latest confirmation of existence of this text was checked on April 4, 1998. H.Y.)

The essence of the above message was emphasized in the appreciation of the spokesperson, Subcommander Marcos, for the participants of the ballot.

Brothers and sisters:

It is not much that we have done, it is true. We have found ourselves in a new country, in a country that has nothing to do with the one that the speeches of the government and the electronic media draw and color. We have found ourselves in a country willing to listen to those whom no one has listened to before, willing to give life to those who have always died in oblivion, willing to talk with those who have always been ignored, willing to include us in the "we" that is covered by the flag with the red and green sides, with the white heart, with the eagle devouring the serpent.

This country which we found on January 1, 1994 and that continues living despite the terror that they want to submit the country to is a proud thing. We are Mexicans, we have always been so. Today it is an honour to call ourselves Mexicans. One of our missions has been completed: we reminded the nation of what its roots were; the mask of a false prosperity was removed by dark hands and old steps. We have nothing to be ashamed of. We are the product of the union of the knowledge and indigenous resistance with the rebellion and courage from the generation of dignity that lit with its blood the dark night of the decades of the 60s, 70s and 80s. From this union we learned to be firm; we have learned to be Mexicans, to live struggling to be worthy of the country that covered us, and to not withhold from it any sacrifice, even including death for its liberty.

We have learned to speak and to listen, to walk without exclusions, to respect the distinct levels and thinkings, to not impose our ideas and not to decree obedience to history, but above all to recognize and correct our errors. And it is from all of you from whom we have learned all of this. All of you have taught us that we are not alone, that our truth can not be imposed as an absolute truth. That to recognize our errors does not make us less, and that to talk of our failures does not dirty our words. No few times we have talked and acted as if the truth and the right did not have any other place than ours, as if we were the possessors of the better road, as if we were the only ones and the best ones. We have hurt good people, but not out of arrogance. Learning we continue to develop and make ourselves new. We are not the same ones as those of December 1993. The EZLN is no longer only the army with a majority of its members indigenous people who rose up in arms against the supreme government. The EZLN is, now and forever, a hope. And the hope, like the heart, is on the left side of the chest.

We are now the product of all of you, of your word and of your nourishment. Today it no longer "all of you" and "we". We are the same.

We are.

>From the mountains of the Mexican southeast.

Subcomandante insurgente Marcos

(Retrieved from gopher://mundo.eco.utexas.edu:70/0R202194-212527-/mailing/chiapas95.archive/EZLN%20Communiques/1995.08%20%28August%29.

— The latest confirmation of existence of this text was checked on April 4, 1998. H.Y.)

It has to be noted that the action, the plebiscite, itself was a message. The insignificant problem affecting the insignificant people was, through the action / message, transformed into a significant issue in the consciousness of people who had been previously unaware of its existence.

Let us come back to the five questions mentioned in the previous section. In the case of Zapatista as illustrated above, the questions could be considered as follows. According to the interpretation by Castells (1997, p77) mentioned earlier, what the Zapatista are fighting against and challenging are 'the exclusionary consequences of economic modernization' and 'the inevitability of a new geopolitical order under which capitalism becomes universally accepted'. In government's announcements and news produced by mainstream media, those two, 'economic modernization' and the 'new geopolitical order', are never to be set in a negative context. They are often interwoven in humanitarian discourses advocating bright hopes for the future: For example, 'economic modernization' would enhance welfare for the poor; the 'new geopolitical order' taking the form of NAFTA

would stabilise terms of international trade, which would further contribute to national welfare; and so on. Such discourses, however, are only surface decorations for an underlying structure as the 'guerrilla research' on the internal report of the Chase Manhattan Bank revealed. This is a highly Foucauldian circumstance, and the first and second questions can be modified for this specific case and answered as follows.

1. Whose benefit is the governmental adaptation to NAFTA as well as policies for 'economic modernization' supposed to support?

They are supposed to support welfare for local communities including those peasants in the southeastern part of Mexico.

2. Whose benefit do they serve?

They primarily serve the decision making communities, banks and financial companies. The policies and decisions are essentially set up and run by parties which can directly procure interests from such policies. This insight can be gained from the fact that when those who are supposed to gain benefit, the peasants, objected to the policies, one of the banks directly involved in NAFTA considered the option to 'eliminate' them as one member of the research community disclosed

It can be noticed that the different answers are given to the first and second question. This dualism is a typical characteristic of the Foucauldian mechanism. In comparison to this dualism, it is interesting to consider the following alternative pair of questions.

Option 1. Whose benefit are the actions made by the Zapatista supposed to support?

Option 2. Whose benefit do the Zapatista's actions support?

A same single answer can be given to these alternative questions. It would be, using Marcos' expression quoted earlier, 'those who have always died in oblivion', 'those who have always been ignored', or the people who have been marginalised in the cruel Foucauldian structure in other words. This coherence is significant. In fact, it is a characteristic of actions of objection to the Foucauldian mechanism. The sharp contrast between the coherence and dualism develops into a very crucial point in the third and fourth, Baudrillardian, questions.

3. Who is pleased by it?

Images of enhancements of welfare through 'economic modernization' or the new international trade agreement shown on TV and written on newspapers do look like signs of "progress", and would please the public not directly involved. Especially if such policies are placed in a humanitarian context on coverages of mass media.

4. Whose benefit is served by those who are pleased?

The pleased public would never dismiss those policies of 'economic modernization' and the new international trade agreement. Rather they would positively support the decision making communities which are executing the measures bringing "bright hopes for future". Hence the interests of the decision making communities and financial institutions are served.

Again, it is interesting to consider a further alternative pair of questions.

Option 3. Who is pleased by the actions made by Zapatista?

Option 4. Whose benefit is served by those who are pleased by the actions of Zapatista?

The answer to the option 3 is, again, 'those who have always died in oblivion' and 'those who have always been ignored'. The actions of Zapatista are designed to stimulate individuals to think and to exchange their thoughts. The answer to the option 4 is, then, again, the same. The coherence observed in the answers to the alternative 1 and 2 remains in these questions.

5. What do those benefits mean to an individual?

To whichever community an individual belongs, those benefits only mean dissolution in the ever unchanging mechanism to him / her. By accepting discourses, propaganda and humanitarian consumables produced through the Foucauldian and Baudrillardian processes, an individual would stop being an independent entity with his / her own perception: an individual would be totally reduced to a vehicle of Foucauldian power or a Baudrillardian relay amplifier of proliferating information.

The final alternative question would be as follows.

Option 5. What do those benefits which the Zapatista is trying to obtain for 'those who have always been ignored' mean to an individual?

The answer would be a re-examination of the world system. In the plebiscite, the Zapatista did not demand the total agreement to their standing point, but only asked individuals to think and invited them to express their

thoughts. Only his / her effort to think and express his / her thought enables an individual to re-examine the world system not at its surface orchestrated by mass media but in depth. An individual can gain a possibility to avoid his / her dissolution in the Foucauldian and Baudrillardian processes only by such re-examination of the world system. The actions of the Zapatista function as a catalyst for an individual to be included in the process to change the world system. The coherence observed in the first to fourth alternative questions lead to this point. The Zapatista is, indeed, a hope.

Then, what does the consideration made on the background and actions of the Zapatista so far in this section imply for Africa? The most important implication is that the coherence identified in the answers to the alternative questions originated from the fact that the party concerned, the Zapatista, was speaking to individuals not indirectly through conventional channels of information flows but directly through the global communication network, the Internet. Their communications with individuals are direct in terms of both space and time: The Zapatista is able to express themselves to, and receive responses from, individuals in different parts of the world in a short period of time. If the Zapatista was only able to communicate quickly with individuals in their neighbouring regions, or within Mexico, they would have been suppressed by the governmental military: The Zapatista was not suppressed. The responses to the internal report of the Chase Manhattan circulated in the Internet explained earlier brought about a different result. If the Zapatista was only able to communicate slowly with individuals in the world, they would have lost the crucial timing to keep being significant in the Mexican domestic politics and beyond, and consequently the would have been marginalised. Marginalisation did not occur, as the plebiscite observed earlier proves. If the Zapatista was not able to communicate with individuals at all, they would not have gained any significance in the first place.

The uniqueness of this ability to communicate directly exercised by the Zapatista would be clearly realised if one tries to understand it in the contexts of figures 4.3.2, 4.4.1 and 4.4.3 featured in the fourth chapter of this study. Those figures cannot accommodate such direct communications and their effects. The Zapatista's ability

to communicate can be understood as a form of network. This particular type of network is fundamentally enhanced by the today's operational technology. Such a network has a potential to terminate the Foucauldian mechanism represented as figure 4.3.2 and the Baudrillardian process represented as figures 4.4.2 and 4.4.3. In an article titled as "CYBERWAR IS COMING!", Ronfeldt and Arquilla (1993 — See the end of the quotation below), senior members of the US's military research institute write:

> The information revolution sets in motion forces that challenge the design of many institutions. It disrupts and erodes the hierarchies around which institutions are normally designed. It diffuses and redistributes power, often to the benefit of weaker, smaller actors. It crosses borders, redraws the boundaries of offices and responsibilities, and generally compels closed systems to open up.
>
> (Originally from "CYBERWAR IS COMING!" in Comparative Strategy, Vol. 12, No. 2, 1993, pp. 141-165.
> Retrieved from http://gopher.well.sf.ca.us:70/0/Military/cyberwar.
> — The latest confirmation of existence of this text was checked on April 4, 1998. H.Y.)

They even make the following suggestion (ibid.):

> The lesson: Institutions can be defeated by networks, and it may take networks to counter networks. The future may belong to whoever masters the network form.

Institutions' pain is individuals' gain. It is noteworthy that the above article was written before the Zapatista's actions, and the authors included analyses of the insurgency in the Chiapas in their subsequent study focusing

on the same issue, 'The Advent of Netwar (1996)' . The issue of network must have become extremely vital. As explained and discussed a number of times in the previous chapters of this study, the Foucauldian concept of power is a 'network of consensus'. Then, the notion of Ronfeldt and Arquilla in the above quotation (1993), 'it diffuses and redistributes power', can be translated as 'diffusion and redistribution of consensus' which is, in essence, a re-examination of the world system. The re-examination of the world system provoked by the Zapatista has been, and is, having an impact not just on the Mexican domestic politics but on the international political order. In the remaining part of this chapter, an attempt is made to analyse the possibility to utilize this function of network in and around Africa for local communities which have always died in oblivion and ignored on the continent.

5.3 Autonomous Communication Networks

Let us have a daydream for a while. Before contemplating difficulties in actualisation of networking in and around Africa, it is useful to imagine how communication networks operate and what they can bring to local communities on the continent in relation to geographical information under ideal circumstance. To start with, an illustration of such communication networks shall be made. The way that Chomsky acquires alternative information which main stream mass media do not offer seems to be an archetype of such networks. In the same interview (1994 — See the end of the quotation below.) as quoted in the previous section, he made the following comment.

> Chomsky: .....Other forms of association develop which are very helpful. There are a lot of people around the world who are in the same position, and without any planning, you tend to get into contact. So a lot of my correspondence is around the world. A lot of my time, in fact, is spent clipping journals, newspapers, professional journals

and so on — actually I bought a Xerox machine for this — and Xeroxing materials to send to people overseas, who are interested in similar things and don't have access to what I see. And they do the same for me. So there's a ton of information flow around the world, from essentially dissidents in many countries. And it turns out to be extremely informative.

So places that I'm interested in, I just know more. I can easily get to know more than they do in the CIA or any academic research center. And the reason is that I have smart agents, not dumb agents. They know what's important and they can dig things out. The countries that I'm really interested in, say Israel — I could never read the Hebrew press by myself, it's just too much of a job. But if I have friends there, clipping for me and sending me articles, they're picking what is important — we sort of share understanding. And I do the same for them. A lot of the work I've done on southeast Asia, Timor and so on, comes mostly from the Australian press. Just tons of stuff from there. And it's reciprocal.

These turn out to be extremely useful networks. These are the ways in which people lacking in resources can pool their efforts, and end up being quite powerful. That's exactly what organization means. And these days, it can be international. A lot of these people are personal friends who I've never seen.

[This interview was recorded at the studios of WRCT Pittsburgh on the morning of March 9, 1994. This transcription appeared in the March 23 issue of the Student Union (Carnegie Mellon University). This interview was broadcast on "Eyes Wide Open" (WRCT Pittsburgh) on March 15 and 22. Noam Chomsky and WRCT Pittsburgh release this document into the public domain.

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(Retrieved from http://www.worldmedia.com/archive/interviews/9403-wrct.html. — The latest confirmation of existence of this text was checked on April 4, 1998. H.Y.)

The keyword to be looked at in this comment is 'reciprocal'. It has to be noticed that even a 'personal' network like this can aggregate a large amount of very significant information as it is reciprocal. The exchange of information by Chomsky and his friends through, presumably, post and fax is yet a 'one from / to many' communication in which Chomsky functions as the one and only node of the network, This network, then, may have limitations in two ways:

1) Expansion of the number of people involved is likely to be slow and inevitably limited to an extent; and

2) Communications among friends of Chomsky could take place only by chance as 'a[A] lot of these people are personal friends who' Chomsky himself has never seen (ibid.)

These limitations are probably insignificant as far as information gathering for a more or less 'personal' interest is concerned. It is, however, crucial to remember that the network that the Zapatista inspired and is effectively utilizing is beyond those two limitations. Expansion of the number of people involved has been very fast so far as the case of the plebiscite indicates; and the autonomous communications played the most important role in the case of the disclosure of the Chase Manhattan's internal report. This is because the network around the Zapatista has multi-nodes, or more concretely, every individual involved functions as a node for flows of information. Such autonomous networks in which there is not a heart to strike but there are millions nodes operating as brains at everywhere could only come into existence with the advent of the Internet. Although the 'one from / to many' type communication still has a role to play, the subsistence of reciprocal information acquisition can be more effectively done through the Internet. In this context, the 'communication networks' of which benefits are conjectured in this section should be realised as the autonomous information networks in which the Internet plays the main role and other forms of communications such as fax play supplementary roles.

What the term telematics means is close to 'communication networks' discussed here.

telematics the set of technologies and services using both information technology and telecommunications for collecting, storing, processing and communicating information

(Virilio, 1997, p152)

If the element of autonomy is added to this definition of telematics, it becomes the Internet. At this point of consideration, it is meaningful to pay attention to Chomsky's remark on the Internet in the same interview as quoted above.

Endres: You were talking about global networking, which my impression is that you do with paper mail. For me, the Internet is just an amazing resource.

Chomsky: That's right.

Endres: Do you use the Internet much?

Chomsky: To some extent. By now, a fair amount of the material I get comes through the Internet. I just find I can't use it much, because the amount of information is such that I get totally swamped. I have friends who filter it for me, and that's a help.

Endres: In general, what do you think are the positive and negative impacts of technology, particularly communications technology, on democracy and activism?

Chomsky: Well, that's a big issue. In fact, it's kind of reminiscent of what happened with radio about the 1920s and '30s. When radio came along — it's like the Internet, it's a fixed resource, it's not like selling shoes. Which means it was obviously

going to be government regulated. No alternative. And the question is, How would it work? Would it be devoted to the public interest, and be essentially a democratizing instrument, or would it be turned over to private power, and commercialized?

There was a struggle over it. There were public interest groups, and church groups, and labor unions, and so on, who wanted it to be a public interest entity. And they lost. It was totally commercialized. And the United States, I think, was alone in the world in that respect. Every other country I know of, at least, went the other way. When television came along, again the US split from the rest of the world, but it wasn't even an issue this time; business just took it over, period.

We're now facing a similar question.

Endres: This is a very vital and vibrant fight at the moment.

Chomsky: Absolutely. And it's very important to know how it goes. It could turn out, as you described, to be a democratizing force, with public participation, or it could end up being a mechanism for corporate propaganda, creating artificial wants, and buying things faster and so on. I think it's going to be the second, just because of the balance of forces.

It doesn't have to be. It could be very significant. This is something that people ought to fight about, because it doesn't have to turn out that way.

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A subtle yet important point that Chomsky did not mention in the above comments is that the Internet has the function of paper mail, reciprocality, to a great extent: Flows of information in the Internet is not one-directional but multi-directional. This point distinguishes the Internet from radio and TV in which flows of information are primarily one-directional, and can make the 'very vital and vibrant fight (ibid.)' more hopeful for individuals. As far as local communities in Africa are concerned, developments of the fight critically depends on whether or not geographical information could stop being an institutional tool and start functioning as an autonomous process consisting of interactions among individuals within and outside of the continent. Desirable outcomes from such networks are speculated with attentions to the contexts of famine, drought and "desertification" discussed in Chapter 3, 4 and 5 of this study as follows.

Such an autonomous process could reduce the risks of famine. Whether physical availability of food, economic entitlement to food or any other factor is the cause for a famine in a particular area in Africa, what a farmer perceives is the "reality" of the famine: The farmer knows whether food is absent within the area physically accessible for him / her, or food sold in local market places is too expensive for him / her to purchase. A famine early warning system driven by the discourse of 'food availability decline' might disregard the prices of food that a farmer perceives unaffordable. A food security system monitoring food prices, which is based on the

discourse of the food entitlement, might miss a sudden decline of food availability caused by shortages of rainfall or any other reasons, that a farmer knows about. Autonomous communication networks linking the perception of such a farmer in the emerging crisis and individuals outside of it, however, would be free from the obsession of any famine theory, and thus could cope with unpredictable developments of a situation by employing an appropriate scientific explanation. Moreover, such networks would make the processes of decision making transparent. Recipients of information from a farmer could watch efficiencies and the meanings of actions made by governments and international agencies such as those of UN and NGOs while making well focused suggestions concerning decisions on the distribution of available food as well as imposing adequate political pressures on governments. The scarcity and the general low quality of data discussed in Section 3 and 4 of Chapter 2 of this study would become less problematic in a short period, and could be greatly improved in the long term: the usefulness of such communication networks would induce an expansion of information senders and recipients within Africa as well as its outside, then the amount of available information would consequently increase; and, the networks could function as effective infrastructures for field workers of statistical bureaux to collect data, and moreover those officially collected data could be further examined by direct communications between farmers permanently in fields and users of the collected data. Such examined data could also be utilised for local actions to plan for future famines.

These advantages of autonomous communication networks for the reduction of risks of famine would similarly apply to the amelioration of droughts as well as to the clarification of the meaning of "desertification" as land degradation in arid and semi-arid areas. Local information derived through such communication networks would be tremendously useful for the verification and generation of synoptic data which could be fed back to local communities for day to day practices. This reciprocity could enable communities involved to take advantages of the concept of 'land use specific drought'. The problem of operationalising this concept in the conventional political economy of information is discussed in Section 3 of Chapter 2 of this study: Vast amounts of information required to monitor the land use and soil moisture content of Africa cannot be

adequately captured, collected, frequently updated, effectively administered and usefully processed in the conventional manner — the clockwise flows of information through local, research and decision making communities shown on figure 4.3.2 in Chapter 4 simply cannot accommodate the amount and dynamism of such information; On the other hand, the autonomous reciprocity achieved by multi-node communication networks would be associated with a higher efficiency — the acquisition, updating and processing of information would be done spontaneously, and administration would be unnecessary. Findings from such collective efforts would be, just like those benefits achieved in the communication networks considered above, would lead to appropriate suggestions and pressures on decision making communities as well as influencing local actions to reduce the vulnerability to drought. "Desertification" would cease to be an 'institutional myth' as the absence of the need for administration in the operation of autonomous communication networks would eliminate political interest in the orchestration of the issue of "desertification" as a critical global issue. "Desertification" as land degradation in arid and semi-arid parts of Africa would be grasped more clearly in a practical manner. The absence of a local voice in the issue of "desertification" mentioned in Section 6 of Chapter 2 of this study would be reached by the presence of local observation of land degradation in communication networks, and thus the marginalisation of local communities would be replaced by a synergy of the efforts made by individuals belonging to different communities.

At this point, it can be noted that the prospects and objectives of interdisciplinarity discussed in Section 5 of Chapter 2 of this study could be less problematically achieved by the 'intercommunality' emerging from such autonomous geographical information networks. While interdisciplinarity cannot help being associated with the unignorable possibilities of becoming another academic consumable to serve the interests of decision making communities and to sustain the ever unchanging Foucauldian relationships among all types of communities, autonomous communication networks would be communally synergistic processes which could not be manipulated by any party. To confirm this point, let us have a look at O'Riordan's comprehension of interdiciplinarity (1995) quoted in Section 5 of Chapter 2 of this study again.

> ...Interdisciplinarity means taking a more negotiated science into the policy realm and engaging with the public. This is because societal understanding is vital to the conduct of science under conditions of great uncertainty, value conflict and data ambiguity. (p 2)

> ...Interdisciplinarity is not just a matter of integration. It is the basis for a fresh way of identifying, defining, interpreting, analysing and solving environmental problems. It involves not just the academic researcher, but also a creative relationship between those who have to act and be responsible for their deeds, and those who prepare the evidence and offer advice on the basis of various methods of enquiry. (p4)

If the word 'interdiciplinarity' is replaced by 'intercommunality' in these remarks, the subtle contradiction of these remarks would vanish. The synergy of academic disciplines is a matter for research communities, but the implementation of interdiciplinarity leading to expected outcomes as illustrated in O'Riordan's insight above involves different types of communities. In cases in Africa, the scarcity of reliable data often induces scientific ambiguity combined with institutional expediency, which effectively maintain the ever unchanging mechanism in which local communities cannot help being subjected to marginalisation. Whether 'interdiciplinarity' is adopted or not, research communities alone cannot change this composition because they are a part of the political economy of power / knowledge themselves. The essential presence of local communities in autonomous communication networks would be, using the expressions from O'Riordan (ibid.), 'the basis for a fresh way of identifying, defining, interpreting, analysing and solving environmental problems'.

The desirable effects of communication networks speculated about in this section can overcome the Foucauldian stalemate identified at the end of Section 6 of Chapter 2. The Foucauldian stalemate, the paradox that any attempt to change the current 'political economy of truth' which is described in Section 1 of Chapter 2 in Foucault's own words (1980, pp131 - 132) are inevitably absorbed by the Foucauldian mechanism and contribute to the dynamic immobility of the regime of power / knowledge, would be overthrown as information

would be openly shared by all networked individuals concerned with a problem or issue. While research, discourse, decision and action are not more than names given to different stages of the self-perpetuating process in which information serves as fuel to prevent fundamental change taking place, a thought expressed over communication networks would be already an action. It is worth remembering that the messages of the Sub-Commander Marcos of the Zapatista sent over the Internet as well as other more conventional networks suggest that individuals did think and their thoughts functioned as a potential deterrent against suppression of the insurgency by the Mexican military as an extension of the domestic government and the 'new world order'. In the same manner, a cluster of individuals' thoughts, investigations and researches broadcast over communication networks could, unlike clusters of opinions and studies in the existing Foucauldian mode of communication, function as significant objectives for, and triggers for further fundamental re-examinations of, the world system. Thus thoughts through autonomous communication networks could lead to changes not just at the surface of problems and issues but at depth in the underlying normally unchanging structure.

The Baudlliardian stalemate identified at the end of Section 3 of Chapter 3 would be also overcome by such communication networks. The Baudrillardian stalemate, the paradox that any attempt to reveal the mechanism of propaganda set by decision making communities and executed by the mass media will be only an addition to already formidably proliferating information. In this proliferation, the meaning and impact of such an attempt itself inevitably diminish. Reports, investigations and messages disseminated over communication networks would no longer be pre-determined folk tales. As quoted in Section 2 of Chapter 3 of this study, De Waal (1998) wrote:

> Journalists know in advance what a 'famine story' looks like and search for the right elements. (p82)

In other words, a report of a disaster, not just a famine or drought or whatever, from Africa by the mass media is nothing more than a parody of already existing stories which are again parodies of their predecessors. The term, 'disaster pornography (Benthal, 1993, p179)' emphasises the same phenomenon in the sense that pornography

is a parody of existing pornographies as well as a product designed to inflate specific emotions of consumers. Manufacturing of such 'folk tales' is possible only because the role of individuals is fixed as recipients of information from mass media. In autonomous communication networks, individuals would be both recipients and generators of information. A pre-determined story would reveal its lack of trustworthiness in such reciprocal flows of information among a large number of individuals because of the capacity of such a system to carry out multiple examinations of a story. The revelations of propaganda would, then, enable the regaining of meaning. Saturation of information occurs as the operation of propaganda in TV news and articles in newspapers is essentially a repetition of the same old stories, however, interactions between individuals will always break up such repetitions. The increase of available information in communication networks will not lead to saturation of information but to a demand for more detailed and multi-faceted information. Alternatives to the viewpoints set and orchestrated by the mass media, such as described by Kellner (1992), McLean (1993) and Fair (1992), to reveal the mechanisms behind of the Persian Gulf War, population control and a newspaper's coverage of the Ethiopian famine as mentioned in Chapter 3, would never be contributions to already proliferating information but cues for further investigations, if they were presented in autonomous communication networks.

5.4 Information technology and informatics of Africa

At this stage it is necessary to come out of the daydream of autonomous communication networks, and contemplate the current status of communication networks in and around Africa. At this point, it is appropriate to confirm how two terms, information technology and informatics, can be distinguished. Foster (1994) writes:

> A Definition of Informatics
>
> It is useful to make a distinction between the terms information technology and informatics. Information technology (IT) means the group of technologies that is

> revolutionalizing the handling of information. In a report that I prepared for UNIDO on their policy for IT, the term informatics was defined as the study, not of IT, but of the consequences of IT, including the variety of ways in which information flows, is processed, is utilized, affects productivity and efficiency, is used for monitoring and control purposes, and lastly, influences socio-economic development and society itself. This is analogous to the use of the term "economics," which refers to the study, not of the production and distribution processes and procedures themselves, but of how they are deployed to provide goods and services from scarce resources to meet human needs.

It has to be noticed that informatics requires IT as a premise to be substantial. There cannot be informatics without IT just as there cannot be, for example, economics on the moon where 'the production and distribution processes and procedures (ibid.)' are absent as there is no human settlement. As observed later in this section, IT in African countries, with the exception of South Africa, may not have been matured enough for Informatics

Algeria	Angola	Benin	Botswana
Burkina Faso	Burundi	Cameroon	Cent. African Rep.
Congo-Kinshasa	Cote d'Ivoire	Djibouti	Egypt
Equat. Guinea	Ethiopia	Gabon	Ghana
Guinea	Guinea-Bissau	Kenya	Lesotho
Malawi	Madagascar	Mali	Mauritania
Mauritius	Morocco	Mozambique	Namibia
Niger	Nigeria	Reunion	Rwanda
Senegal	Seychelles	South Africa	Sudan
Swaziland	Tanzania	Tchad	Togo
Tunisia	Uganda	Zambia	Zimbabwe

Table 5.4.1 44 countries and territories which have full INternet access

to operate effectively. The desirable outcomes from autonomous communication networks speculated in the previous section could only be a daydream in this sense. It is, then, understandable that most projects concerned with information and communication for Africa by governments, NGOs and other international organisations try to achieve development of IT infrastructure as the primary objective, and the utilisation of informatics for political, social and economic developments as the second objective in the long term. Needless to say,

fulfillment of the second objective hinges on fulfillment of the first objective. The uncertainty in the primary objective, the development of the IT infrastructure, seems to be inducing the interests of decision making communities in the Foucauldian sense, and the informatic daydream may become another humanitarian consumable which marginalises local communities in the Baudrillardian sense. In the perceptions of decision making communities, the new science, informatics, might be appearing as an *a la mode* toy, a "marketable" institutional tool which is expected to please the public. It might, however, be necessary to take the fundamental peculiarity of the medium into account: communication is different from any economic processes and procedures in the sense that 'none of us will ever manage to regulate' it as argued by Eco (1987, p41) in Section 4 of Chapter 1 of this study. There is a possibility that if a few small patches of autonomous communication networks come into existence and start functioning, they might spontaneously expand over the continent of Africa. Let us consider this possibility through the observation of IT and informatic attempts being carried out in and around Africa as follows.

It is reasonable to say that technical aspects of IT infrastructure development in an African country converge at its Internet connectivity. Internet connectivity involves the availability of two important components of IT, points and lines of information. They are appropriate computers and reliable telecommunications networks. Computers, the core of IT in any sense, are points to receive, send, generate, modulate and amplify information. Telecommunications networks linking computers are lines for flows of information. The latest status (the first quarter of 1998 — at the time of writing of this study) of African Internet connectivity as the convergence of IT infrastructure development can be observed from the WWW site of the Southern Africa's Nonprofit Internet Service Provider (SANGONeT) as follows:

1. Forty four countries and territories shown as table 5.4.1 have full Internet access.

2. Five countries, Gambia, Liberia, Sierra Leone, Cap Verde, and Sao Tome et Principe have plans for full Internet access in their capital cities;

2B1 Foundation	International Telecommunications Union (ITU)
African Development Bank (ADB)	Italian Government Co-operation
African Highlands Initiative (AHI)	Kellog Foundation
Agence de la Francophonie (ACCT)	La Francophonie (ACCT) + other francophone agencies
Agence Francophone pour l'Enseignement Sup. (AUPELF)	Mellon Foundation
BellaNet	Ministère de la Co-opération Français
British Council	OCIC Service Missionaire
CAB International	Open Society
Canadian International Development Agency (CIDA)	Organisation for African Unity (OAU)
Canadian Ministry of Foreign Affairs	ORSTOM
Carnegie Corporation	Pan African News Agency (PANA)
CICEN	Provincial government of Quebec
Centre Int. pour le Développement de l'Inforoute (CIDIF)	Reseau electronique francophone (REFER)
Collaboratory for Information Society Development in Africa	
Satellife	Common Market for Eastern and Southern Africa (COMESA)
School of Information Studies for Africa (SISA)	Commonwealth Of Learning (COL)
Service for IT in International Agriculture (SITIA)	COMNET-IT
Southern African Development Community (SADC)	CTA
Standing Conf. of Afr. Nat. & Univ. Libs. (SCANUL)	Council for Scientific and Industrial Research, SA (CSIR)
Swedish International Development Agency (SIDA)	Department for International Development (DFID)
UN Development Programme (UNDP)	Dutch Ministry for Co-operation (DGIS)
UN Economic Commission for Africa	European Community
UN Ed., Sci. & Cult. Org.(UNESCO/IIP)	European Space Agency
UN Environment Programme (UNEP)	Fondation de Devenir (FDD)
UN Industrial Development Organisation (UNIDO)	Food & Agriculture Organisation of the UN (FAO)
UN Office for Outer Space Affairs	Fredrich Ebert Stufting (FES)
UN Operations Support (UNOPS)	Global Information Infrastructure Commission (GIIC)
UNITAR/ORSTOM	GTZ - Deutsche Gesellschaft
United Nations University (UNU)	Human Sci. Research Council of S Africa (HSRC)
US Agency for International Development (USAID)	InfoDev
Volunteers in Technical Assistance (VITA)	International Council of Museums (ICOM)
Vrije Universiteit of Brussels (VU)	International Development Research Centre of Canada (IDRC)
World Bank	International Documentation Network on the Great Lakes
World Health Organisation (WHO)	International Federation of Library Associations (IFLA)
WorldSpace	Int. Inst. for Communication and Development (IICD)
World Trade Organisation (WTO)	
Australia Agency for Int. Development	Japan International Co-operation Agency
Caisse Française de d veloppement	New Zealand Ministry of Foreign Affairs
Danish Agency for International Dev. Assistance	Norwegian Ministry of Foreign Affairs
Disposnit de Cooperation	Oxfam UK
Finish Ministry of Foreign Affairs	Swiss Int. Co-operation
Irish Ministry of Foreign Affairs	

Table 5.4.2
81 development agencies carrying out projects to support 'Information Communication Technologies (ICTs)'
(Source: http://demiurge.wn.apc.org:80/africa/partial.html)

3. Nine countries, Angola, Benin, Botswana, Egypt, Ghana, Kenya, Morocco, South Africa, Tanzania have local Internet service providers in some secondary towns;

Food and Agriculture Organisation of the UN (FAO) http://www.fao.org

- Regional Animal Disease Surveillance and Control Network (RADISCON). Support for information exchange by assisting with Internet connections in 29 countries, including North Africa. Budget $1.25M from IFAD. ddhon@fao.org
- Global Agricultural Database. FAO is working on ways to make its database more widely available via the Internet.
- Rural Connectivity support. Support for access to the internet for rural development.

Don Richardson drichard@uoguelph.ca www.fao.org/waicent/faoinfo/sustdev/CDdirect/CDDO/contents.htm

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Satellife http://www.healthnet.org

- HealthNet. A support network providing email connections for health workers and researchers in developing countries. In many countries Healthnet uses a LEO satellite based system using packet radio to provide a link to the Internet. The service is usually based at medical faculties in African universities or at major hospitals. Healthnet nodes are currently operational in Botswana, Burkina Faso, Cameroon, Eritrea, Ethiopia, Gabon, The Gambia, Ghana, Kenya, Malawi, Mali, Mozambique, Nigeria, South Africa, Senegal, Sierra Leone, Sudan, Tanzania, Uganda Zaire, Zimbabwe. HealthNet and VITA (see below) are collaborating on radio-based connectivity projects. support@usa.healthnet.org

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Swedish International Development Agency (SIDA) http://www.sida.se

- Developing country ICT support programme. SIDA has created a new fund open to both Swedish and developing country participants that will focus on the application of ICTs in social sectors, in particular, job creation. The number of applications is likely to determine the overall level of funding. Initially however, $2-3m a year will be provided. Aside from the SK100m given to projects in sub-Saharan Africa since 1990, it has provided about SK10-15m in telecom training support in Sweden.

Pastoral information network support programme. University of Nairobi, Department of Range Management in Kenya will provide support for basic research training of students up to MSc-level, and strengthening of the research on production systems in arid areas through seminars, exchange of teachers and common projects as well as cooperation with practitioners and decision-makers. The project includes the following three parts: a) basic research training for students from the IGADD-countries (Djibouti, Somalia, Ethiopia, Sudan, Uganda and Kenya) and Tanzania; b) traditional resource management in order to develop better production systems, and c) distribution and utilization of scientific results through international seminars and conferences. Budget: 10,750,000.00 SEK. Dr Farah Kassim

- UDSM 2000 system for information, planning and finance management. In collaboration with Rockefeller and Ford Foundations, the University of Dar es Salaam will upgrade its administrative and decision support system. Tanzania. Additional Funding Required 500 000.00 SEK
- Centre for Research, Training and Information for Women in Development (CERTWID). CERTWID is a unit within the Institute of Development Research at Addis Ababa University, Ethiopia. Main aim is to develop human resources for qualified academic research and training at the university. It also plans activities such as gender training and documentation for the needs of ministries and international organizations in Addis Ababa. Budget: 200,000 SEK
- Satellite data and Geographical Informations System. Support for use of remote sensing, GIS, exploration and management of groundwater resources with pilot projects in Botswana and Ghana, assisted by Chalmers University of Technology', Department of Geology, Gothenburg Sweden. Results from both project areas will be used in the final evaluation of the GIS/satellite data methodology. Budget: 250,000.00 SEK. Dr Gustafson Gunnar.
- Media Institute of Southern Africa network(MISA). Supports the establishment of MISANET, the electronic network used by independent media in Southern Africa.
- MISA and Econews Africa is organising a conference on New Information Technologies, Telecommunications Policy and Development. It will be attended by about 100 delegates from 16 African countries, these delegates will represent, media and policy NGOs, developmental ISPs and established regulatory bodies. The conference will be held in Johannesburg 5-8 May 1998, at the same time as the ITUs Africa Telecom 98 event.

African Museums Connectivity project. Namibian technicians are equipping 20 African museums with dialup Internet connections. http://www.natmus.cal.na/africa1m.htm

UNDP http://www.undp.org

Sustainable Development Networking Programme (SDNP). Agenda 21/Sustainable Development networking support which focused on providing Internet access but is now increasingly working on building content. There are operational or formative nodes in Angola, Benin, Cameroon, Gabon, Malawi, Morocco, Mozambique, Tchad, Togo, Tunisia. Budget: $12M. http://www3.undp.org/countries/africa.html/ Chuck Lankester Chuck@sdnp.undp.org

- Internet Initiative for Africa. Africa Bureau's programme to reinforce national Internet development in 12 countries through 2-3 year project partnerships between government, UNDP, the PTO and the private sector for which the local government must provide 50% of the project funds, up to a maximum of $500 000 which will be matched by UNDP. Countries currently short listed are: Angola, Burkina Faso, Cap-Verde, Gambia, Mauritania, Namibia, Nigeria, Democratic Republic of Congo, Sao Tome et Principe, Swaziland, Tchad and Togo. Discussions are also taking place with Tanzania, Rwanda, Burundi, Sierra Leone and Ethiopia. Gambia, Nigeria and Mauritania have signed MOUs, Tchad likely to v soon. In addition a distance learning pilot project is also planned but the country has not been selected - proposals are currently being solicited. The Southern African workshop is planned for Zimbabwe in the first week of February. Vic Falls

Richard Kerby rkerby@undp.org

Small Island Developing States Technical Assistance Programme (SIDSTAP). UNOPS/SDNP programme which includes establishing content development and hosting infrastructure for small island states, some of which are in Africa - Cap Verde, Comoros, Mauritius, Seychelles, Sao Tome et Principe. (S647K) Lalaoio Kaim lkaim@sdnp.undp.org

Table 5.4.3 Annotations of some of agencies on the table 5.4.2

(Source: http://demiurge.wn.apc.org:80/africa/partial.html)

USAID http://www.usaid.gov

- Leland Initiative: A project to provide about $0.5million per country to assist with developing Internet connectivity in 20 African countries in return for agreements to liberalise the market to 3rd party Internet service providers and to adopt policies which allow for the unrestricted flow of information. Assistance is in the form of equipment, expertise, training and free circuits for the first year. Countries qualifying for assistance are: Benin, Botswana, Cote d'Ivoire, Ethiopia, Eritrea, Ghana, Guinea, Guinea-Bissau, Kenya, Mali, Madagascar, Malawi, Mozambique, Namibia, Rwanda, Senegal, South Africa, Tanzania, Uganda, Zambia and Zimbabwe. Countries that have signed the MOU and are receiving support are: Benin, Cote d'Ivoire, Guinea, Guinea-Bissau, Madagascar, Mali, Mozambique, Rwanda, Zambia

Lane Smith, lasmith@usaid.gov

- http://www.info.usaid.gov/regions/afr/leland

- Leland Extension: In countries where connectivity is in place, USAID is examining the possibility of supporting expansion of connectivity into the secondary cities and outlying areas. All Leland countries can qualify, but priority is being placed on Mozambique, Madagascar, Mali and guinea. Lane Smith, lasmith@usaid.gov

- http://www.info.usaid.gov/regions/afr/leland

- AfricaLink: Provides support for dialup Internet or email connections and modems for specific African researchers, mainly in the agricultural field. AfricaLink is also financing sub-regional 'help-desks' in east Africa (Uganda) and Southern Africa (SangoNet in South Africa) and is working on establishing a West African help desk with WARDA and ENDA in Senegal. Jeff Cochrane jeffc@info.usaid.gov

- Recently AfricaLink and Ungumsha have begun discussions on the re-formulation of help-desks so they are not dependant on any one donor and to work on the establishment of national help desks

- GLOBE initiative: Will help to electronically link US schools with schools in developing countries for environmental monitoring projects.

- ICTs in African Libraries: US Information Agency programme to support the use of ICTs in libraries through a grant to Senegal's West African Research Association (WARA)

- ExecNet (proposed): Establishment of an electronic network of African senior staff members in the offices of the President, Prime Minister, Cabinet and General Secretariat of the Government. Lane Smith

lasmith@usaid.gov

- Greater Horn of Africa Initiative (GHAI): USAID is providing support for institutions in the countries of the Horn of Africa concerned with food security planning, including the Ministries of Agriculture and Foreign Affairs, to connect to the Internet.

The World Bank http://www.worldbank.org

- Knowledge Society re-alignment: A major re-emphasise of the World Bank has taken place to support application of ICTs in all of the Bank's sectoral programmes. For example, in Africa, in Mozambique, the sector programmes will now pool funds to support the use of ICTs provincial departments of health, education, agriculture statistics and public administration

- WorldLinks for Development (WorLD): EDI providing support for linking 1200 public schools in developing countries to the Internet. Ghana and Mozambique, Senegal, South Africa and Uganda are the first in Africa to receive support, followed by Mauritania, Mali and Cote d'Ivoire. Linda Meginnis lmeginnis@worldbank.org, Sam Carlson scarlson@worldbank.org, Robert Hawkins

RHawkins@worldbank.org 45M worldwide

- Regional Environmental Momentum Programme (REMP): Multimillion dollar programme to support environmental information management in Central Africa (Cameroon, Gabon, Zaire, Congo, Central African Republic and Equatorial Guinea). The provisional programme co-ordinating office is based in Gabon and the initiative is working in collaboration with GEF and UNDP's SDNP. Jean-Marc Lusson

prgs_urgc@compuserve.com

- Programme for Environmental Information Systems in Africa: The Environment Group of the World Bank is establishing a secretariate for programme the in Pretoria, South Africa. Mrs. Marie-Louise Verlaeten

mverlaeten@worldbank.org

The World Bank also has a number of direct support programmes for ICTs in Universities in Africa, most notably in Mozambique. Robert Hawkins rhawkins@worldbank.org

Table 5.4.3 Annotations of some of agencies on the table 5-2 (Continued.)
(Source: http://demiurge.wn.apc.org:80/africa/partial.html)

4. Eight countries, Burkina Faso, Malawi, Mali, Mauritius, Morocco, Senegal, Tchad, Zimbabwe have nationwide local dial-up Internet access through which a private user can connect to the Internet by using a modem.

(http://demiurge.wn.apc.org:80/africa/partial.html)

These figures are neither significant nor insignificant by themselves, but another list provided by the same WWW site is useful in combination with them. Jensen of the Association for Progressive Communications

(APC), who is monitoring the above figures, catalogues development agencies carrying out projects to support 'Information Communication Technologies (ICTs)' with annotations. According to this monitoring, 81 organizations as shown in table 5.4.2 are engaged in such projects. This catalogue leads to an annotation of each of the agencies in the same WWW page. Some examples are shown in table 5.4.3. What can be noticed from these lists and annotations shown in the three tables is the odd "universality" of ICT in which connectivity to the Internet is the main pillar.

The number of African countries which have been, and are planning to be, connected to the Internet, the number of agencies which attempt to enhance Internet connectivity of African countries, the amounts of investments being made by those agencies for such projects are extraordinarily extensive. At this point, it is interesting to recall Chomsky's comparison of Internet in this decade to radio in the 1920s in the interview (http://www.worldmedia.com/archive/interviews/9403-wrct.html) featured in the previous section. The Chomsky's comparison was in the context of commercialisation of media. We could add another aspect to this comparison: radio was "universally" implemented all over the world, and connection to the Internet is being "universally" attempted in Africa. Radio and the Internet seem to be independent from geographical and socio-economic diversity. This similarity might be easy to miss, but is significant. Just as it is possible to have a radio and to listen to, for example, BBC World Radio Service in almost anywhere in the world, projects to improve Internet connectivity can be planned for any part of Africa ranging from humid tropical countries to arid desert countries, from coastal countries to landlocked countries, and from poor countries to the poorest countries. Most development projects for Africa cannot enjoy such "universality". Environmental projects for the protection of biodiversity in tropical lowland rainforests cannot be transferred to an arid country; projects to monitor "desertification" cannot be conceived for a humid tropical country. This diversity might be understood as a matter of course, yet it does explain the extensiveness of countries and development agencies concerned with the Internet connectivity as shown in the tables, and moreover, indicates the ease for decision making communities to jump on the bandwagon of IT infrastructure development for Africa. It is reasonable to assume

that such ease is further enhanced by discourses of modernisation, development and humanitarianism. The odd "universality" is, however, implying the possibility that the Internet could be a kind of Trojan Horse: Decision making communities are welcoming projects for IT infrastructure development for their own interests, which might induce the Internet as a foundation for individuals to fight against the Foucauldian and Baudrillardian processes, to change the relationships among local, research and decision making communities, and to invert the marginalisation of local communities.

Further contemplation of the points and lines of information, computers and telecommunications networks, is in relation to the possibility of the informatic Trojan Horse. Castells (1998, pp93-95) observes the use of computers in Africa as follows,

> Most computing work is aimed at routine data processing, with little computer-aided decision-making. The public sector, the overwhelming force in African economies, proceeds with "blind computerization," induced by the ideology of modernization and/or by financial enticements by foreign computer companies, without actually using installed computer power to process relevant information. Regulations often impose centralized acquisition of computer equipment by the public sector, and tax private firms to discourage independent imports. The limited computerization of Africa has become another source of the economy or of public service. In the 1980s, half of the computers introduced in Africa were aid-donated, most of them technologically obsolete, so that experts consider that Africa has become the dumping ground for a mass of equipment made obsolete by a fast-moving technological revolution.

An usual marginalisation of Africa is pointed out in this comment. An observation from inside of the dumping ground of obsolete technological equipments, Africa, seems to have a delicately different nuance, however. A Dutch Journalist, Hegener, wrote an article on telecommunications in Africa for the 25 November 1995 issue of the Dutch weekly `Vrij Nederland`. It includes his interview with the secretary general of the African

Association of Universities at that time, Professor Ekong, who was encouraging the use of electronic mail among members of the continental-wide organization.

> In addition to a fully-functional telephone network, e-mail requires PCs. The first thing most Dutch people ask when they hear about the Internet in Africa is: "But they hardly have any PCs there, do they?" This is a fallacy, says Professor Ekong: "PCs are widespread in African universities - that's not the problem. The greatest factor limiting the spread of e-mail in Africa is the lack of technical knowhow, followed by the faulty telecommunications infrastructure."
>
> (Retrieved from http://www.sas.upenn.edu/African_Studies/Acad_Research/it_hagener.html — The latest confirmation of existence of this text was checked on April 4, 1998. H.Y.)

These comments, one from outside of African computation and the other from inside, seem to agree that the number of computers existing in Africa is not the impediment. The point which is not fully agreed by the two comments is whether or not those computers are obsolete. In consideration of this disagreement, attention has to be paid to the difference between the time periods to which the two comments are referring: While Castells talks about computers brought to Africa in 1980s, Ekong talks about computers existing in the mid-1990s. The comment of Castells (1998, pp93-95) quoted above lacks a notion for backward compatibility of computing technology. Technological revolution is fast and capability of computers increases very rapidly, however, there are certain landmarks in the progresses. The electronic mail is one of such land marks. While capacity of a personal computer produced in the early 1980s might not be enough to receive, send and store electronic mails, neither a computer produced in the late 1980s nor one produced in the late 1990s have such a difficulty. Although it is true that a personal computer produced in the late 1990s has a higher capacity than that produced in the late 1980s, both of them have passed the technological land mark, sufficient handling for the electronic mail. This point suggests that even if Africa is the dumping ground of obsolete technology, the rapid technological revolution in the developed countries may make the obsoleteness of the computers 'dumped' to

Africa increasingly unimportant as far as informatics of the continent is concerned.

Now, let us look at lines of information, telecommunications networks, these infrastructures are as important as the computer terminals. Ekong's recognition of problem in his comment above, 'the faulty telecommunications infrastructure', echoes Castells (1998, p92).

Kebede (1994, pp89-90)	Jensen - 1998 http://demiurge.wn.apc.org:80/africa/partial.html
The Ethiopian Telecommunication Authority (ETA) came into being in January 1953 with responsibility of catering for national as well as international telecommunication services, excluding military telecommunication. The telecommunication services offered by ETA include telephony, telegraphy, and telex Existing facilities for domestic communication include long lines, microwave, UHF, and RRC transmission systems. For international telecommunication traffic, the ETA depends mainly on its INTELSAT standard earth station SUT-1A. Some international trafic is also handled by the PANTEL microwave system. An important feature of the development programme of ETA is the commencement of digitalization in 1989, which has led to the development of an integreated services digital network. Along with the digitalization of networks, telex, facsimile, data transmission, international subscriber dialing, and a national data-processing service have been introduced. ETA is also implementing a computerized management information system To consolidate the sixth Development Programme (1984-1988) and to extend telecommunication services to remote areas, the next plan premised on the National Development Programme is under preperation. This, plan, which is scheduled for 1989-1994, envisages digitalization of the older microwave routes and opening up of some 320 remote stations using terrestorial radio systems and small satellite earth stations. As for switching, 20 more digital exchanges worth a capacity of about 60,000 will be connected to the network, bringing the total capacity to 268,000 lines	Country: ETHIOPIA ISPs: ETA: http://www.telecom.net.et Ethiopia has a relatively reliable telephone network but it is extremely difficult to get new lines. With a massive rural population Ethiopia has a formidable task in developing national connectivity. However it does have an active and broadly constituted national Internet working group, BITE, which has produced the most comprehensive national information infrastructure in Africa plans to date. Unfortunately the PTO - Ethiopian Telecommunications Authority does not appear to be particularly willing to devolve any responsibility for building the infrastructure, declaring itself to be the monopoly ISP and requesting other email store and forward service providers to cease operations. With the large number of International organisations present in Addis - (OAU, UNECA, almost every embassy, etc.), the PTO could derive substantially increased revenues from Internet traffic if these organisations chose to route their non-critical traffic through the public network, rather than using their autonomous private systems. (Retlerved from http://demiurge.wn.apc.org:80/africa/ethiopia.htm)

Table 5.4.4 **Telecommunication development in Ethiopia:** Late 1980s to late 1990s

.....the critical aspect of computer use in the Informational age is its networking capability, which relies on telecommunications infrastructure and network connectivity. Africa's telecommunications are meagre, compared with current world standards. There are more telephone lines in Manhattan or in Tokyo than in the whole of Sub-Saharan Africa. In 1991, there was one telephone line per 100 people in Africa, compared to one for 2.3 for

Nwachuku (1994, pp118-119)	Jensen - 1998 http://demiurge.wn.apc.org:80/africa/partial.html
.. .In Nigeria, responsibility for the public telecommunication service is vested in Nigeria Telecommunications Ltd (NITEL) (a new liability company created in 1985, in succession to the now defunct Post and Telegraphs Department, to run the telecommunication service on a commercial basis). The network has several limitations including inadequate trunk facilities, low grade of service, frequent system breakdown, and a long waiting list for new connections. To date, the Nigerian telephone network uses electro-mechanical equipment. Current estimates are that there are 205,000 connected telephone sets in the country, giving a density of 2 telephones per 1,000 person, which is among the lowest in the world (The comparative figure for the United States is 500 per 1,000 persons, and Ghana has 7 telephones per 1,000 persons.) The Nigerian corporate computer user is beginning to demand facilities for wide area computer networks as well as data communications. Examples are the banking industry, NITEL, NEPA, WAEC, and the military. At present, the demand is judged insufficient to warrant the establishment by NITEL of a data communication service using the existing voice facilities, although availability can also induce greater demand. Dial-up facilities and leased data lines are in use in the Lagos area, but, as pointed out by Denloye, an operator of a leased line "is left pretty much on his own to attach whatever equipment he chooses to the line. He can expect no help from NITEL in determining the quality of the line he leases, and has to ensure correct operation himself." The oil industry has taken a lead in establishing their own data network with or without the involvement of NITEL. Shell has installed an X-25 packet switched data network between Lagos, Port Harcourt, and Warri using trunk lines leased from NITEL. On the other hand, the NNPC has recently completed a private telecommunication network said to be the largest in Africa. The all-digital network incorporates 875 km of optical fibre cables, and will come under the Integrated Data Services Company, one of the 12 new subsidiary limited liability companies established by the NNPC in 1988 as part of its new commercialization programme. The NNPC installation is an interesting development since it is a chink in the armour of monopoly invested in NITEL.	Country: NIGERIA ISPs: LinkServe: http://www.linkserve.com.ng Cyberspace: http://www.cyberspace.net.ng PInet: ianre@nigeria.pinet.net Nigeria has a very limited telephone network - about 6 cities have IDD. Recently a packet switched X.25 service was set up via Telkom SA's VSAT based SpaceStream service to South Africa and further data services to link the major cities for data communications are in process by the national telecom operatore - Nitel. While SpaceStream can supply a digital link to Nigeria, there are no digital services inside Nigeria, which restricts bandwidth to 9.6Kbps. Most universities have radio links and rely on telex. There are about 30 Universities and 25 colleges in Nigeria, of which about 20 have large computing facilities. The WorldBank is looking at the feasibility of establishing a Universities network linked to the Internet. There are at least four private sector store and forward service providers in Lagos and two full Internet service providers on 9.6Kbps analogue links. A 64Kbps international line costs about US128 000/year. Nitel is planning a 2Mbps international Internet backbone by March 1998. UNDP's IIA project is providing some assistance for the Nigerian Internet Group, the National Universities network (NUCNet) and the development of national databanks. Motorphone has obtained an independant VSAT license for Internet and voice, and is may become one of the largest service providers. Siemens is the dominant supplier of telecommunications equipment to Nitel. (http://demiurge.wn.apc.org:80/africa/nigeria.htm)

Table 5.4.5 **Telecommunication development in Nigeria:** Late 1980s to late 1990s

all developing countries, and 37.2 for industrial countries. In 1994, Africa accounted for only about 2 percent of world telephone lines. Some of the obstacles to developing telecommunications come from government bureaucracies, and stem from their policy of keeping a monopoly for their national companies, thus slowing down their modernization. Permission is required from national telephone operators to install any telephone device. Import of telecommunications equipment is expensive, and uncertain, as it is often "lost" in customs.

This general observation for Africa is concise, but are lines of information in Africa fundamentally and permanently hopeless? Some concrete examples would be useful to update, examine or accept the notion held by Ekon (Hegener, 1995) and Castells (1998, p92). Case studies of three African countries can be carried out to gain more insights into telecommunications infrastructure of Africa as follows. The left columns of the three tables, 5.4.4, 5.4.5 and 5.4.6, feature observations of telecommunications in Ethiopia, Nigeria and Tanzania. These observations were made, as one part of the UNU (United Nations University) / TCD (Trinity College, Dublin) project, by academic researchers of each country in the late 1980s: the Ethiopian part was written by Kebede (1994) of the Ethiopian Science and Technology Commission, Addis Ababa; the Nigerian part by Nwachuku (1994) of the Department Electronic Engineering, University of Nigeria; and the Tanzanian part by Mgaya (1994) of the Faculty of Commerce and Management, University of Dar es Salaam. The right column of the same tables feature the current status (the first quarter of 1998 — at the time of writing of this part of this study) of telecommunications of the same countries with special references to Internet connectivity as reported on WWW by Jensen of the APC mentioned above. Technical and administrative details of those observations shown in the tables might be redundant, but a careful examinations would reveal useful points for consideration of the Internet in Africa as the informatic Trojan Horse. Clearly, each of the three countries has had a different experience in the decade between the late 1980s and the late 1990s. The comparison of the left and right column of the tables could be attempted for each country as follows:

1) **Ethiopia** — Refer to the table 5.4.4. In the following interpretation, (L) denotes that 'see the left

Mgaya (1994, pp146-147)	Jensen - 1998 http://demiurge.wn.apc.org:80/africa/partial.html
Tanzania does not have a packet switched data network (PSDN). Data are transmitted using the long-established paublic switched telephone network (PSTN). The Tanzania Post and Telecommunications Corporation (TPTC) monopolizes all telecommunication matters in the country. At present the organization has no intention of setting up a public data network. It is more concerned with the expansion and modernization of the existing facilities, especially the telephone system. In Dar es Salaam alone, for example, about 30,000 people are waiting for telephone facilities. The TPTC, however, provides leased circuits to customers who do not wish to use the PSTN facilities. Several international companies and foreign embassies use leased circuits for data transmission. Leased circuits may soon be used by the National Bank of Commerce and other financial institutions. The TPTC has started to install digital telephone exchanges. So far two of them have been installed, one in Morogoro with 2,000 lines and the other in Zanzibar with 3,000 lines. Digital exchanges could be used to set up an integrated services data network (ISDN), which is capable of transmitting data directly. With this development it seems that Tanzania will jump from PSTN to ISDN, skipping PSDN. Also related to data transmission is the installation of facsimile machines. Demand for telefax services has risen very rapidly .several private organizations have established telefax bureaus. The TPTC is in the process of establishing its own telefax bureau.	Country: TANZANIA ISPs: Twiga: http://home.twiga.com (Dar)and http://www.cybernet.co.tz (Arusha) University of Dar es Salaam: http://www.udsm.ac.tz Raha: http://www.raha.com Internet Africa: http://www.intafrica.com Cats-Net: http://www.cats-net.com Global: http://www.globalxs-tanzania.com (no longer accessible?) Wilken: http://www.wilken-dsm.com TZ Online: http://www.tzonline.com Africa Online: http://www.africaonline.co.tz Zanzinet: http://ras.zanzinet.com Others: Tanzanian Parliament: http://www.bungetz.org Undergoing rapid modernisation, the very poor telecommunications infrastructure in Tanzania will hopefully no longer be the major barrier it has been in the past to the spread of email and full Internet services. The capital city, Dar es Salaam, has now seen dramatic improvement of the local infrastucture, with many digital exchanges being installed, the availability of two cellular telephone networks, and now, a half dozen Internet service providers. Nevertheless, network access in areas outside Dar is still very limited. The $240m multi-donor funded Tanzanian Telecommunications Restructuring Programme (TRP), responsible for much of the improvements in Dar, will also improve the links to many secondary towns and will be engaged in upgrading the network until 1998. Fibre cable is being layed in Moshe and Arusha and the Dodoma-Dar-Zanzibar-Tanga-Moshe-Arusha microwave links are being digitised, as are links to Morogoro and Mwanza. Currently telecommunication links in northern Tanzania (Arusha) are more reliable to Kenya than to the capital in the South. The economic union of Kenya, Tanzania and Uganda has resulted in telecommunication links between these countries not being tariffed at international rates. This could encourage the development of sub-regional Internet links between ISPs in these countries. Following the revitalisation of the East African Co-operation, plans have been discussed for a 'high speed digital information highway' linking Dar, Nairobi and Kampala. There has also been talk of a fibre optic necklace around Lake Victoria, but the economic viability of this proposal is still in question.

(Jensen - 1998, Continued.)

Regulatory functions in the telecommunications sector were separated from operations in November 1995 with the establishment of the Tanzania Communications Commission (TCC) and the Tanzania Telecommunications Co Ltd (TTCL). The Ministry of Communication and Transport is in the process of formulating a national communications policy, a draft of which has already been circulated. There is a strong likelyhood that the TTCL will be privatized in the next few years. The TCC is planning to establish a fund to support private sector activities in rural areas which is expected to be contributed to by the operators. In general, the TCC encourages private companies to make joint ventures with the TTCL.

The TCC has carried out a census of telecommunications and postal operators, and aside from the TTCL which is the national operator, Zantel, a private company, operates in Zanzibar. Licensed under value added services are three mobile cellular providers - Mobitel, (an analogue system using TACS), Tritel, (a GSM system), and the TTCL is also installing a GSM system. The country is divided into 4 zones - coastal, northern, central, southern highlands and TTCL has a cellular license for all but the coastal zone where it has a joint venture with Mobitel. Rental of a cellular phone costs about $100 a month.

The TTCL is itself currently involved in two projects that relate to data communications development. It is the focal point for one of the Telecentre Fund's multi-purpose community telecentre projects being planned in four or five African countries as part of a joint co-operation initiative of the ITU, UNESCO, IDRC and possibly the FAO (other interested partners are also being invited to join). While a final proposal for the project has yet to be submitted, the town of Sengerama near Mwanza has been provisionally selected for the telecentre site. It is hoped that the local hospital will become involved along with other users, especially in the fields of business, agriculture, fishing, education and local administration.

In addition, TTCL has had discussions with the US's Leland Initiative about the possibility of providing wholesale Internet services in Tanzania. The idea is currently being discussed by a TTCL internal committee established to study the matter. It appears that the group is keen to develop a financial model for the service within which to consider the need for external funding but lacks sufficient experience to evaluate the business and technological requirements. It also appears that TTCL may have some difficulty in providing the service because it would be competing with its subsidiary Datel's wholesale Internet service and there is evidence within TTCL that this could become an issue.

The local subsidiary of Scitor (now Equant), SITA Telecom Holdings, has been providing X.25 based point-to-point international data connections to many agencies connected to the airline industry in Dar and Arusha for some years. It has just upgraded its analogue 19.2Kbps analogue satellite-based leased line from TTCL to 64Kbps digital to cope with the additional traffic.

In Arusha, a Fido node running as a small business by Mr Erik Rowberg has been operating for over 2 years, supplying local email services in the Arusha/Moshi area. The charges are: Installation: $50 (incl. training) (Introductory software training: $13 / day + $30 deposit. Non-for-profit account: $15 / mo (unlimited local email) + $0.20 / Kb (internet gateway). Commercial account: $30 / mo (unlimited local email) + $0.20 / Kb (internet gateway).

In Morogoro, the Sokoine Agricultural University (SUA) has recently started operating a local email Fido service which originally made daily calls to Muhimbili, but now calls COSTECH due to the telephone line problems and also because of the co-operation now taking place with COSTECH to obtain a full Internet connection with Norwegian funding. Phone lines are good and a 14.4Kbps connection can be achieved without difficulty.

Table 5.4.6 Telecommunication development in Tanzania:
Late 1980s to late 1990s

(Jensen - 1998, Continued.)

Finally, CEEST, an environmental NGO, operates a Fido service for some NGOs from Dar. Tanzania Online operates a commercial UUCP based service in Dar and Zanzibar Town and the Mission Aviation Fellowship (MAF), the Christian relief organisation, is known to operate a node from Dodoma.

In the near future the town of Hakara is likely to have access to electronic mail because the African Medical & Research Foundation (AMREF) office there decided at the end of 1995 to install a SatelLite groundstation. Although this has not yet taken place, the equipment, installation, training and support costs (17 K$) are to be shared with 5 other initiatives - The Tanzania-Netherlands Project to support AIDS control in Mwanza region (TANESA), Kuliana, the Farming Systems Research (FSR), the Agricultural Research Institute (ARI) and the Training Institute of the Ministry of Agriculture (MATI). About 500Kb per day can be transferred over the satellite link which is expected to be installed shortly. Further information may be required from TTCL to establish its modernisation plans in the Hakara area.

Many other international agencies operate their own independent communications facilities, such as UNDP, which uses the Higgins system to connect daily to New York, and UNICEF which use the cc:Mail system to connect to UNEP in Nairobi. UNICEF connects over 70 PCs on its internal LAN to email via the locally maintained cc:Mail post office which dials Nairobi every 45 minutes. It plans to connect its offices in Kigoma, Zanzibar and Mwanza with the same system if the telephone lines permit.

Table 5.4.6 Telecommunication development in Tanzania: Late 1980s to late 1990s

column of the table 5.4.4', and (R) the right column.

Ethiopia has seen a more or less steady progress in IT infrastructure development. The country has 'a relatively reliable telephone network (R)' now, but its development programme for 1989 to 1994 to open up more than 300 remote stations and to increase the capacity of digital switching to 268,000 lines (L), seems to have been unsuccessful, or not enough, and inclusion of the massive rural population on to the national telecommunication networks still appears to be a 'formidable task' and it is still 'extremely difficult to get new lines' (R). Although it is not willing to take any responsibility for building the infrastructure (L)', the Ethiopian Telecommunication Authority (ETA in the left column and PTO in the right column), which has been in charge of telephony, telegraphy and telex since 1953 (L), is now declaring the monopoly Internet service provider, and trying to terminate other 'email stores and forward service providers' (R). The 'active and broadly constituted national Internet working group, BITE, which has produced the most comprehensive national information infrastructure in Africa plans to date (R)' seems to remain significant for future in relation to the on-going administrative domination of the ETA.

2) **Nigeria** — Refer to the table 5.4.5. In the following interpretation, (L) denotes that 'see the left

column of the table 5.4.5', and (R) the right column.

Nigeria seems to have become a huge air pocket of the world telecommunication networks. The country has not experienced a remarkable change internally, but externally is woven into digital links connected to the world outside through South Africa's SpaceStream (R). The figure for the domestic telecommunication infrastructure in the late 1980s, '2 telephones per 1,000 person (L)', is even less than the figure for the whole of Africa mentioned by Castells (1998, p92) in the earlier quotation, 'i[I]n 1991, there was one telephone line per 100 people in Africa'. The IT infrastructure within Nigeria has been, and probably is still, far below the average of Africa.

3) Tanzania — Refer to the table 5.4.6. In the following interpretation, (L) denotes that 'see the left column of the table 5.4.6', and (R) the right column.

Tanzania is experiencing a dramatic enhancement of IT infrastructure. In fact, only exceptions from Jensen's observation of the latest Tanzanian IT infrastructure can be shown in the right column of the table 5.4.6. The Tanzanian Post and Telecommunications Corporation (TPTC) were monopolising telecommunications of the country in the late 1980s, but, at least, it had commitments for improvements of the infrastructure (L). It did start digitisation of telephone exchanges (L). In the late 1990s, the Tanzanian Telecommunications Restructuring Programme (TRP) is successfully setting up many digital exchanges and cellular telephone networks in Dar es Salaam (R). It is also improving links to many secondary towns. Implementation of fibre cables and digitisation of microwave links are being carried out in a number of regions as well (R). Overall it is possible to say that decentralisation of administration and management of telecommunications is the characteristic of the dramatic enhancements of IT infrastructure in Tanzania: 'Regulatory functions in the telecommunications sector were separated from

operations in November 1995 with the establishment of the Tanzania Communications Commission (TCC) and the Tanzania Telecommunications Co Ltd (TTCL) (R)'; and, 'The TCC encourages private companies to make joint ventures with the TTCL (R)'. The existence of the six private Internet service providers (ISPs) (R) is also remarkable.

While it is easy to dismiss development of telecommunications networks in Africa as a hopeless task by looking at overall general figures, the concrete experiences of the three countries seem to imply that the prospects may not be entirely negative. Despite of the different experiences, the three countries share one common point in their experiences. It is the presences of foreign / international organisations in their telecommunications infrastructure development. In the case of Ethiopia, the large number of international organisations existing in the country such as the OAU and UNECA can be considered the potential source of revenue for the ETA as pointed out by Jensen in the right column of table 5.4.4. In the case of Nigeria, the presence of international organisations, or more precisely multinational oil companies, was already explicit in the late 1980s. As shown in the left column of table 5.4.5, Shell installed its own data network using trunk lines leased from the Nigeria Telecommunications Ltd., and the Nigerian National Petroleum Corporation (NNPC) completed a private digital network (Nwachuku, 1994). Although NNPC is a 'national' company, it 'has joint participation ventures or production sharing contracts with all foreign oil companies operating in Nigeria (http://www.mbendi.co.za/cyngoius.htm)'. Nwachuku (1994) considers the NNPC's installation of digital telecommunication network interesting as 'it is a chink in the armour of monopoly invested in NITEL'. In the case of Tanzania, fundings from, and joint ventures with, international organisations substantially propel the rapid IT infrastructure development. Many of such international organisations have already been operating their own independent communications facilities as shown in the right column of the table 5.4.6: UNDP connects daily to their headquarters in New York; UNICEF communicates with UNEP in Nairobi every 45 minutes through emails.

The presences of international / foreign organisations, multi-national oil industries in the case of Nigeria,

echoes to the ease for decision making communities to jump on the bandwagon of IT infrastructure development for Africa discussed earlier. What becomes interesting after the observation of the three countries is the effect of the presence of such international / foreign organizations. In the case of Nigeria, as Nwachuku (1994) points out the private digital network of the multinational-oil industry was a crack in the solid monopoly of the NITEL. The bare necessity of communication network let the oil industry break through from the bureaucratic boundary. At this point, it is useful to recall the remark of Ronfeldt and Arquilla (1993 — See the end of the quotation below) on 'the information revolution' quoted earlier.

> It [the information revolution] crosses borders, redraws the boundaries of offices and responsibilities, and generally compels closed systems to open up.
>
> (Originally appeared in "CYBERWAR IS COMING!" in Comparative Strategy, Vol. 12, No. 2, 1993, pp. 141-165.
> Retrieved from http://gopher.well.sf.ca.us:70/0/Military/cyberwar.
> — The latest confirmation of existence of this text was checked on April 4, 1998. H.Y.)

The rapid development of IT infrastructure in Tanzania can be explained in this context: decentralised administration and management in telecommunication accommodates joint ventures with foreign and domestic organizations, and functions as the ground to receive and to distribute fundings from international agencies. The economic union of Tanzania, Kenya and Uganda adds another interesting aspect to this context. The union 'resulted in telecommunication links between these countries not being tariffed at international rates' as reported by Jensen (1998 — see the table 5.4.6). The networks are indeed redrawing the boundaries.

At this point of consideration, it is necessary to comprehend the standing point of those international organisations, especially those concerned with socio-economic development in Africa. Their attempts to

enhance IT infrastructures of African countries are driven by two different motivations. On one hand, development of telecommunications networks in an African country is considered a sub-set of more general economic development; enhancement of IT infrastructure is among lists of other development priorities such as rural development, food security system or water management. The Foucauldian and Baudrillardian approaches are valid in an analysis of this motivation. The enhancement of telecommunications networks in Africa fits discourses of development very well, provides political and economic opportunities to decision making communities and research opportunities to research communities, and thus the Foucauldian structure is maintained. At the same time, images of the global village in which African populations are not excluded but connected to the world telecommunication networks are great humanitarian consumables in the Baudrillardian sense. On the other hand, enhancement of IT infrastructure of African countries is required by those international organisations having local offices to operate. In any international organisations, its members need to communicate with each other for briefing, the submission of reports and so on. An important point to be noted is that although they could rely on their own private telecommunications networks for their operations to a certain extent, such closed systems would soon become insufficient devices to convey information; once a private telecommunication network comes into existence for an organisation involving local offices scattered over vast geographically areas, communications among members of the organisation start increasing rapidly, then the closed network would become inevitably insufficient and economically unsustainable. The only solution to this is to make their private networks a part of the network of networks, the Internet. This is already taking a place as seen in the case of Tanzania.

Let us come back to the possibility that the Internet in Africa could be the informatic Trojan Horse. The two motivations explained above imply two likely consequences. First, the attempts by international organization to enhance IT infrastructures in African countries would be a permanent part of their development agendas. This is because those organizations need; 1) to act upon social scientific discourses of development in which enhancement of telecommunications networks is highly likely to have an importance; and 2) to satisfy their own

technical requirements to operate. Secondly, developments of telecommunications networks would keep redrawing bureaucratic boundaries of domestic organisations as well as opening up closed circles of communications within international organizations. This is because development of IT infrastructures, especially the enhancement of Internet connectivity, in an African country: 1) requires fundamental decentralisation of administration and management of telecommunication networks; and 2) makes closed private networks held by international organizations economically and technically insignificant. These two likely consequences increase the probability of the Internet being the Informatic Trojan Horse. The first likely consequence would be a persistent attempts by both international and domestic organizations, which would make introduction of the Internet to an African country increasingly probable in long term. The second likely consequence would be the formulation of circumstances in which the introduced Internet gains more autonomy than expected by research and decision making communities, which is a part of what the term, the informatic Trojan Horse, connotes.

It is noteworthy that there are IT infrastructure development projects conceived at continental and sub-continental scales apart from those attempts at national levels observed so far. They are uses of communication satellites and installation of fibre cables. The website of the Africa TELECOM 98, a conference held by International Telecommunication Union (ITU) in 1998, explains an overview of such continental-scale attempts as follows:

> Geostationary satellite operators providing bulk-transport of international traffic progressively supplemented the undersea cables (first concentric cables and more recently optical fiber) over this period. Currently several implementations of Low Earth Orbit Satellite systems, are competing for access to different bands of the frequency spectrum in order to offer global telecommunication services. Soon the challenge of providing a range of telecommunication services from narrow band to broadband off a single satellite platform, including voice, data and image applications, would be overcome. There is already a momentous shift towards intelligent

> applications and the provision of information services. These developments and others, such as Internet, VSAT services and Direct-to-Home broadcasting, all point towards the convergence of technologies, services and applications into a global universal network. All of these would require considerable investment in infrastructure and, in order to attract investors, the establishment of appropriate regulatory frameworks, consistent with international best-practice.
>
> (Retrieved from http://www.telecom98.co.za/newtech.html.)

Communication satellites and large scale installations of fibre cables would surely exceed existing boundaries to a great extent, however, it has to be noticed that the above overview implicitly expresses an usual combination of two normally opposing factors, bright prospects of new technologies and financial constraints. The fate of a project conceived by AT&T indicates the formidable nature of financial constraints. Africa One, the AT&T project launched in 1994, was to lay optical fibre cables around the continent with 2.5 gigabytes per second gateways to all the coastal countries interested (Hegener, 1995 — http://www.sas.upenn.edu/African_Studies/Acad_Research/it_hagener.html). This project was effectively abolished in 1997 as AT&T sold its undersea technological division, Submarine Systems, to TYCO International (http://www.att.com/press/0497/970411.cha.html; Yoshida, 1998). The new owner of the Submarine Systems, TYCO, seemed to recognise no commercial significance in the continuation of the project. Despite this rather symbolic example, it is, however, necessary to realise that the combination of the prospects of the new technologies and financial constraints is not always destined to stagnation. The conference held by ITU itself is an indication of persistent efforts. The development of IT infrastructure in African countries will keep being a major issue in agenda of development agencies and other international organisations.

What do IT infrastructures in Africa observed so far in this section suggest? It may be reasonable to say that despite financial and bureaucratic obstacles, attempts of IT infrastructure development in the continent will continue. International organisations and commercial corporations cannot go backward in the era of telecommunications, but the information revolution is not easy in Africa, and therefore their attempts will have

to be prolonged indefinitely. Castells' warning (1998, p164) is insightful in this context. According to him, 'the Fourth World' in which certain communities have no escape from social exclusion, a result of marginalisation from informational capitalism, is emerging. He writes (1998, p164):

> In this end of millennium, what used to be called the Second World (the statist universe) has disintegrated, incapable of mastering the forces of the Information age. At the same time, the Third World has disappeared as a relevant entity, emptied of its geopolitical meaning, and extraordinarily diversified in its economic and social development. Yet, the First World has not become the all-embracing universe of neo-liberal mythology. Because a new world, the Fourth World has emerged, made up of multiple black holes of social exclusion throughout the planet. The Fourth World comprises a large area of the globe, such as much of Sub-Saharan Africa, and impoverished rural areas of Latin America and Asia. But it is also present in literally every country, and every city, in this new geography of social exclusion.

It is necessary to keep paying attention to the conflict between persistent institutional attempts and economic constraint: The latter can easily keep most local communities of Africa be a major and permanent component of the emerging Fourth World.

At this point, it is useful to come back to the case of Zapatista observed earlier in this chapter. What level of telecommunication infrastructure was available to those insurgents in the south-eastern region of Mexico? . Although it is true that the Zapatista was utilising the Internet extremely effectively to defend themselves by announcing their existence to individuals all over the world, it is not true that each of the group of the indigenous people was directly speaking to the world outside. As the Subcommander Marcos himself admits, the success of the Zapatista's communication strategy was the result of supportive informatic activities by individuals outside of the region. This can be applied to Africa. To actualise the daydream illustrated in the previous section of this chapter, and also to enable local communities in Africa to avoid being any part of the emerging Fourth World, supportive informatic activities by individuals outside of Africa is essential.

The arguments made so far in this chapter lead to the following notion. Just as the Trojan Horse in Homer consisted of a giant wooden horse and armed Greeks in its belly, the informatic Trojan Horse for Africa would consist of both telecommunications infrastructures as the container and supportive informatic activities as contents. In other words, not just developments of IT infrastructures but design of geo-informatic products functioning as an interface for different perceptions held by different communities is required. Such products would also support the discourse of IT infrastructure development in Africa further. Then, the following two points emerge as requisites for future of local communities in Africa. First, continuous attention has to be given to the status of telecommunications infrastructure in Africa. Obstacles in the process of IT infrastructure development need to be publicly discussed and examined. Such examinations would be of benefit of development agencies and other international organisations in the Foucauldian sense, but at the same time, maximises the probability to actualize the Informatic Trojan Horse for Africa. Such monitoring and examination of changing states of IT in Africa are already actively carried out by a large number of researchers and IT professionals as seen in an Internet mailing list service called the 'African Network of IT Experts and Professionals (ANITEP) List'. Any individual interested in the issue of the IT and telecommunication in the continent can join discussions and exchange of information accommodated by this autonomous service by sending an electronic mail to 'AFRIK-IT@IRLEARN.UCD.IE'. Secondly, design of geo-informatic products is required. Developments of IT infrastructures in Africa require permanent efforts over years and decades, but attempts to design appropriate geo-informatic products to enable African local communities to choose their own fates should not be left as a task to be done in future. They need to be started now. In the next chapter, considerations and technical attempts will be made on the basis of this notion.

Chapter 6. Geo-informatic Products for Autonomous Communication Networks

6.1 Introduction

The objective of this chapter is to lay a foundation for the scope of future research. At the end of the previous chapter, the analysis made two points. The first is that attention has to be paid to obstacles to the development of IT infrastructures in Africa, and the second is that efforts to design geo-informatic products functioning as interfaces for diversified perceptions held by different communities can be started now. This chapter focuses on the second point, the design of geo-informatic products. Discussions on, and technical demonstrations of, such geo-informatic products in this chapter are primarily for further consideration by individuals as opposed to institutions. In the following sections, the nature of geographical information is considered first, two important issues related to geographical information, modelling and labelling, are analysed, and finally an attempt is made to develop some information and products to exemplify issues raised in the preceding conceptual discussions. The products illustrated in the later section of the chapter are primarily concerned with the utility of such information in autonomous communication networks.

In this chapter, attempts to generate geographical information products as components in autonomous communication networks are made. These attempts will not in themselves enable individuals to counter conventional Foucauldian and Baudrillardian flows of information. They are, however, a starting point. The following comment by Foucault (Baudrillard, 1987, p65) mentioned in the first chapter of this study is relevant:

> "As in judo, the best answer to an adversary manoeuvre is not to retreat, but to go along with it, turning it to one's own advantage, as a resting point for the next phase."

The creation of geographical information products for autonomous communication networks needs to be based on the observation of differences between information in synoptic contexts and information in definite contexts.

Continuous efforts to deploy this approach can liberate not just individuals in local communities but all other communities shackled in the Foucauldian regime of power / knowledge and Baudrillardian mass production of humanitarian consumables. To this goal, every point is a starting point, and how an adversary manoeuvre can be turned into one's own advantage continues to be a challenging question for every individual involved. Improvements of the capacity of personal computers and the Internet will immensely assist struggles for liberation.

6.2 Synoptic contexts and definite contexts for information

An appropriate point to start the design of geo-informatic products is an examination of characteristics of existing modes of information acquisition and consequent processings. An item of geographical information can be ascribed to either of the two types of context: a synoptic context and a definite context. Comprehension of the difference between them is necessary before initiating any analysis of existing geographical information flows. A piece of information in a synoptic context resembles a bird's eye view; information in a definite context resembles an insect's-eye view. A bird flies and observes the ground at a distance, while an insect stays on the ground and its vision is exclusively oriented to an object of immediate interest. Let us use remotely sensed images and the vision of a person on the ground as examples for understanding of the two different contexts. Remotely sensed images are usually captured in a synoptic context. Any point on a remotely sensed image has a meaning only in relation to other points. For instance, a point can be perceived to be less vegetated or less rich in a specific mineral in comparison to other points. The vision of a person on the ground is, on the other hand, often in a 'definite' context. The person can focus his / her attention on an object that he / she can see, and the object such as a tree or a well can have a definite meaning for the viewer. For example, the tree is putting forth leaves, or the well is dry. One who uses a piece of geographical information in a synoptic context is consciously or sub-consciously aware that the information is only a part of a larger geographical entity. On

the other hand, a larger world is not relevant for one who contemplates a specific feature in a definite context.

Let us see another pair of examples, a topographic map and a architectural plan. The former demands a synoptic context, while the latter is predetermined to be in a definite context. A user of a topographic map is aware of two things. One of these is that the coverage of the map is a rectangular cut out of a larger geographical area, and the other is that height of any point on the map has a meaning only in relation to other points. He / she knows that the map itself or anything on the map is at only one level of geographical scale. On the other hand, broader geographical scales, the world outside in other words, does not exist for a viewer of an architectural plan of, for example, a building. The plan may show all the details of the building but not those of neighbouring buildings. An important point to be noted here is that these two types of context are often overlap. The observation of a person on the ground goes through a synoptic stage as he / she overviews the landscape before his / her attention is concentrated on a tree or a well. Similarly, with an aim such as the observation of a particular feature, again a building for example, a remotely sensed image could be in a definite context after going through an overviewing stage to detect the location of the target. Then, the role that overview plays becomes an important indicator. It indicates, as it is determined by, to which context a piece of information is ascribed. If a piece of information is presented in a synoptic context, the overview is the goal of observation. If the piece of information is in a definite context, the overview is only an intermediate procedure of observation, and the recognition and examination of a particular object is the goal. This principle is, however, only an entrance to complex flows of geographical information.

How a context for a piece of information is determined? It is determined by the interests of observers. Then, the process of determinations goes as follows.

Interest of an observer

determines

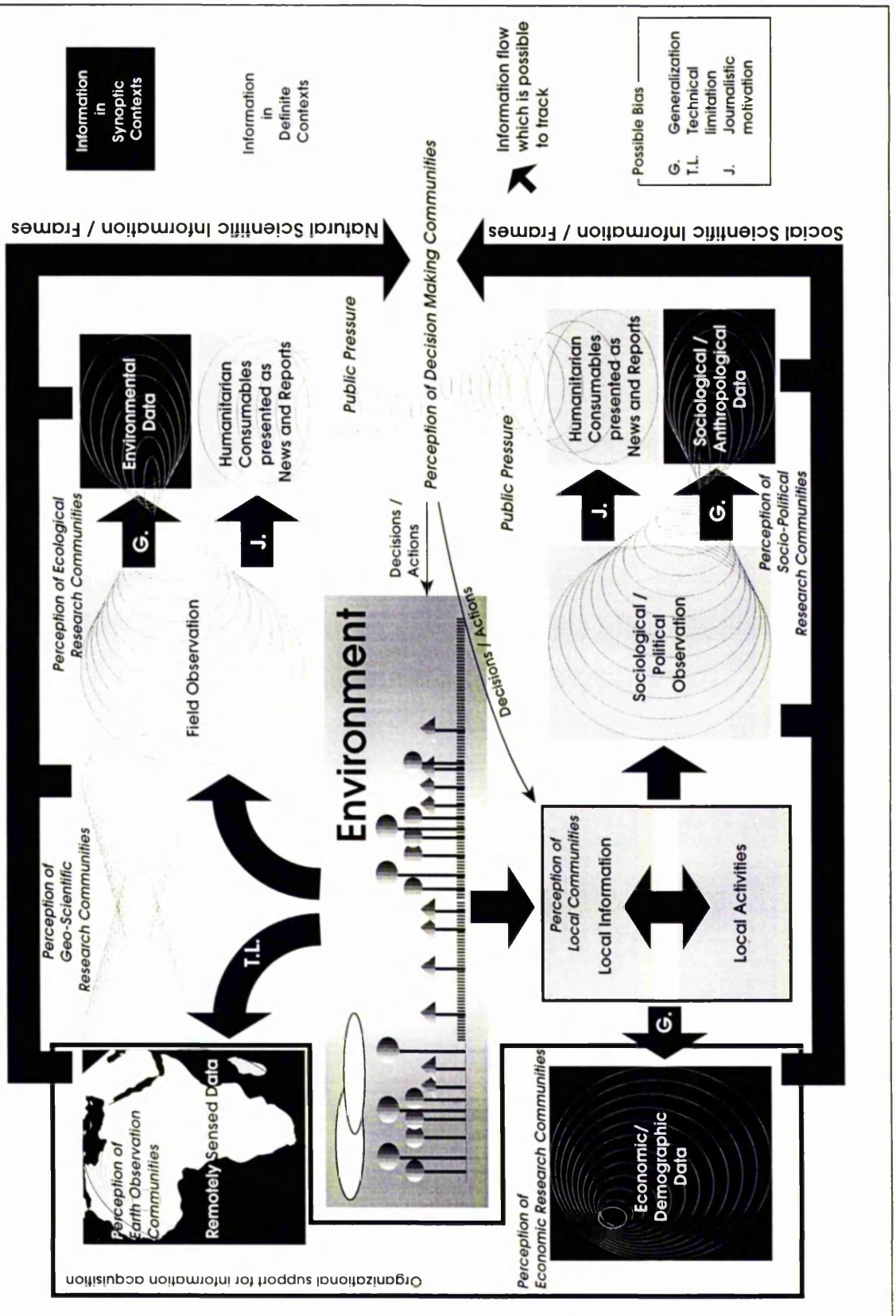


Figure 6.2.1
Information in Synoptic and Definite Contexts

Context of information

(Synoptic / Definite)

determines

Role of the overview

(The goal / An intermediate procedure)

Complication starts from here as a piece of information produced through this determining process can be subjected to another interest of another observer. In other words, a piece of information is frequently relocated between the two contexts. This is illustrated in Figure 6.2.1. Annotations for the figure are as follows . It is possible to regard flows of information from the local communities / environment to decision making communities through research communities, the point 1 to 8 explained below, as Foucauldian information flows, and those through mass media, the point 9 and 10, as Baudrillardian information flows.

1) Three kinds of information can be derived from the environment. They are remotely sensed information, local information acquired by local individuals, and information acquired through field observation by outsiders. The local individuals, outsiders and remote sensing scientists, consciously or sub-consciously, filter the information from observations of the environment according to their interests.

2) Remotely sensed information are primarily in synoptic contexts. Consequent processing of this type of information keep them in synoptic contexts in most cases.

3) Local information is primarily for local activities such as farming, and naturally in definite contexts. The local individuals retrieve information from such activities as well as from their environments for their specific interests. Information flows among the local

individuals takes place at this point. In other words, local information is digested and increased within the local communities.

4) Two kinds of information flow from the increased local information often through interviews and questionnaires. One of those is economic / demographic information which is substantially quantitative. Perception of the economic research community depends on this type of information, and interpolation is often carried out by economic researchers for their own interests. Through such interpolation, pieces of local information are relocated in synoptic contexts. It has to be noticed that such interpolation can be a source of error, as well as, functioning as a bias for other communities intending to use the processed information.

5) The other kind of information originated from the local information is acquired through sociological / political observation, again, often by means of interviews and questionnaires. This kind of information can be both quantitative and qualitative. Such information is often derived through attempts to simulate and to describe the perception of a local community, a family or even a person. At this point, pieces of local information acquired by outsiders are still in definite contexts. Generalisation of sampled local information, however, is often carried out as a consequent procedure. Such generalisation changes the context of the local information from definite ones to synoptic ones.

6) The fate of environmental information acquired by outsiders is similar to that of sociological / political information acquired from the local information. Environmental information from fields, by sampling in most cases, are in definite contexts at the outset as environmental scientists have specific interests. Pieces of environmental information acquired at points on the ground are, however, often interpolated, generalised and relocated in synoptic contexts.

7) Environmental and sociological / political information for regional , national and

international scale analyses are produced in the way described in the fifth and sixth points above. The process of generalisation, in the case of sociological / political information, is likely to result in the omission of quantitative aspects of the original observation and the increase of qualitative statements. This may be also applicable to the environmental information but to a lesser extent, as the disciplines of environmental sciences tend to demand quantitative aspects of original field observations as proof.

8) Pieces of information which have gone through relocations of their contexts from definite to synoptic become matrices for the evolution of discourses. Both qualitative and quantitative pieces of information in synoptic contexts are presented to decision making communities as suggestions, and they are consequently converted into policies and actions to be fed back to local communities and environments.

9) Observations of environments and local communities provide materials for mass media to produce news and feature stories. Information from observations of this sort in actual villages and fields are basically in definite contexts. The 'overview' is rarely the final goal for journalists, but a story of a particular feature and incident is. Information from such observations are carried out through "human eyes" possessed by journalists who are from societies to which recipients of such reports and feature stories belong. Then, such media coverages gain intuitive acceptance by the public. Information conveyed by TV, newspapers and magazines are destined to be simplified and generalised, and finally transformed into folk tales, or "pornography", of environments and local communities. Information in definite contexts acquired by journalists in fields are thus converted into various humanitarian consumables in synoptic contexts, images of prevailing environmental degradation or emergencies of local communities in Africa, which the public demand.

10) Generalised images of local communities and environments are likely to be transformed

into public pressures through public perceptions. Such public pressures urge the decision making communities to take action. Interests of decision making communities play an important role at this point. Information flows of very short span come into existence to maximize and to adjust political interests. They are to be produced and consumed within the communities. "Insiders' lobbying" could be a good example of such a short span information flow. There can be two types of outcomes from such public pressures. One of these will be plans and projects for the development of local communities or environmental conservation. In the actualisation of this type of outcome, decision making communities take advantage of suggestions made by research communities as mentioned in the eighth point above. The other is over-emphasised high profile humanitarian performances by decision making communities including NGOs. Those performances are to be fed back to the public through TV and newspapers in definite contexts.

Let us examine change of contexts for information in these two types of information flows (Foucauldian and Baudrillardian) respectively.

In Foucauldian information flows, continuous conversions of evolving academic hypotheses take place. Their conversions are driven by various academic interests. They influence decisions and actions insofar as they satisfy the political and economic interests of decision making communities occur. Underlying socio-political structures remain intact. Examples of such Foucauldian information flows are the evolutions of discourses of famine, drought and desertification as explained in Chapter 2 of the study and graphically illustrated in Figure 4.3.2 in Chapter 4. In the case of famine, the academic analyses transformed information in definite contexts acquired from environments and communities (e.g. economic parameters such as ' Crop Production in Ethiopia: Crop Evaluations' or 'Calorie Consumption per head in Sahel Countries' in Sen (1981) looked at in Section 4 of Chapter 2) into generalised discourses of famine (e.g. FAD approach in the 1970s and Sen's entitlement approach in the 1980s) in synoptic contexts. Such transformation have led in turn to the development of early

warning systems (e.g. 'crisis-oriented early warning systems' and 'food security oriented systems') took place. The scientific discourses presented to decision making communities as suggestions were fed back to local communities as actions. The evolution of discourses of famine, generated through conversions of contexts for information from definite ones to synoptic ones, maintained homeostasis among constellations of local, research and decision making communities.

A point to be noted is that the accuracy of information relocated from definite contexts into synoptic contexts is often a neglected issue as the cross-reading of Famines and Poverty (Sen, 1981) and Social and Economic Statistics for Africa (Kpedekpo and Arya, 1981) carried out in Section 4 of Chapter 2 of this study indicates. A discourse for local communities and environments in Africa is almost always a castle in the thin air of inadequate information having been relocated from an original context to another one. In the cases of drought and desertification, as discussed in the second chapter of the study, remotely sensed images, information primarily in synoptic contexts, played important roles. As mentioned in Section 3 of Chapter 2, UNDRO mistook green spots of acacia trees on images derived from a satellite sensor as recoveries of crop / pastoral production in Ethiopia in 1984, which led to delayed actions to counter the intensifying famine on the ground (Kent, 1987, p22). As mentioned in Section 6 of Chapter 2, the illusion of the advancing desert originated from Lamprey (1975) was significant in the promotion of "desertification" from a mere scientific topic to discourses about an urgent global environmental problem. Remotely sensed images, which are intrinsically in synoptic contexts do not need the process of interpolation / generalisation and provide convenient great scientific flavours for decision making communities to support their institutional expediencies.

Production of geographical information in synoptic contexts is fulfilled via complicity with the mass media and the humanitarian interests of the public in Baudrillardian information flows. Information in definite contexts acquired by journalists in local areas are processed and presented in forms that the public are pleased to receive. A range of "scientific" methods of interpolation and generalisation are applied to information acquired from

environments and communities by researchers and then transposed in context from definite to synoptic in Foucauldian information flows. Information acquired by tentacles of the mass media by contrast are transplanted into synoptic contexts without the rigour associated with "scientific" method but with the addition of the humanitarian flavours demanded by recipients in Baudrillardian information flows. Information acquired by a journalist in a village with its own name in a specific situation in a specific country is transformed into a feature story of "a village in Africa", and then received as "the situation of Africa" by the public.

Examples of this complicity can be found throughout Chapter 3. The most straightforward example among those may be found in the four primary discourses in the New York Times' coverage of the Ethiopian famine as identified by Fair (1992). Terms to illustrate the famine such as '*agony of famine, fear of food crisis*' were developed to '*scenes of horror*', and finally to a '*continent of misery*' (ibid., p114) as elements of the discourses of crisis on the newspaper; and, the stories were 'about them' but 'not by them' (ibid., p116). Perceptions of local individuals were, then, assumed, and generalised phrases with appetising humanitarian seasoning for the public such as "the people hope it will rain" or "the people are hungry" (ibid., p117) were produced as elements in the discourses of the locally situated communities. When what is demanded by consumers is absolutely clear, suppliers naturally produce it, hence,

> Journalists know in advance what a 'famine story' looks like and search for the right elements. (De Waal, 1998, p82)

The complicity in which such transplantations of information from definite contexts into synoptic contexts take place is a convenient mechanism for decision making communities to mobilise the public to support specific policies. The operation of propaganda based on this mechanism can be understood as the management of information according to the requirements of pre-conditioned public. Mass production of humanitarian consumables by mass media enables decision making communities to carry out such informatic demand management. The most important characteristic of such manufactured information in synoptic contexts is repetition. The content of propaganda only repeats but does not evolve just as contents of pornography

permanently remain the same. This process is natural as mass media essentially collect news materials not from fields in Africa but from preconceptions of their audiences and readers whose interests are, like those of audiences and readers of pornography, permanently fixed. Repetition of news stories having the same composition as Benthall (1993) caricatured, then, lead to the fixation of an image of Africa, and consequently to void of meaning of information. In public perceptions, the continent becomes a permanent adventure playground where heroic relief operations or sanguine development are to proceed, or a permanently troubled and isolated place where people will keep being hungry. A new piece of information taking a form of news story would neither change nor add anything to those fixed images of the continent. This is the state of voiding the meaning of information; the destination of humanitarian cannibalism in other words.

"Scientific" generalisation in Foucauldian information flows and the complicity in Baudrillardian information flows make an interesting contrast. They fulfill the same function, the production of information in synoptic contexts, but in different manners as examined above. What is the cause of the existence of two different mechanisms fulfilling the same function? Conventional modes of communication produce two types of information flows as well as the mechanisms relevant to them. Academic reports, oral presentations and correspondence convey information in Foucauldian information flows. Newspapers, magazines and TV transmit and amplify information in Baudrillardian information flows. The most important difference between these two modes of communication is, as explained in the beginning of Chapter 3, in velocity of the transmittance as well as of multiplication. The slower mode of communication, namely Foucauldian information flows, tolerates the execution of "scientific" methods of generalisation such as interpolation, and information in synoptic contexts are produced for relatively small numbers of recipients. The faster mode of communication, namely Baudrillardian information flows, does not tolerate such "scientific" generalisation, but complicity between the mass media and the public produces information in synoptic contexts. In either case, the final outcome cannot be positive for local communities in Africa as discussed above. It is appropriate to recall the comment by De Waal (1989, p30) quoted earlier in this study: 'famine victims live (or die) under an alien definition'. Local

communities exist to be marginalised and utilised as material to satisfy interests of other communities through two modes of communication and two different mechanisms of generalisation.

In the previous chapter, a new mode of communication was described, explained and discussed. Autonomous communication networks, or telematics with an emphasis on autonomy, being actualised in the Internet have a potential to make unexpected links among individuals and to enable individuals to counter Foucauldian and Baudrillardian flows of geographical information produced by the conventional modes of communication. As discussed in the previous chapter, there is a significant possibility that the Internet will become an informatic Trojan Horse infiltrating into those flows of information.

Consideration so far in this chapter suggests some key features for the design of geo-informatic products to be conveyed by autonomous communication networks. Those involved in such new attempts must be aware of the confluence of information in two different perceptual contexts. With geo-informatic products designed to function as catalytic interfaces of information, the Internet would bring its capacity to make unexpected links to enable individuals who have access to one type of information in one context to gain access to information in another context. For example, an economic researcher would be able to examine prevailing discourses of development by integrating his/her main research material consisting of information from national censuses with information provided by farmers in remote locations. Or, farmers would be able to relate their own information in a 'definite context', such as water levels of wells to a wider geographical scale by gaining access to information in a synoptic context such as remotely sensed images.

6.3 'Modelling' and 'labelling'

To consider further the key criteria for the design of geo-informatic products to be developed in and conveyed by autonomous communication networks, the following two topics shall be examined. They are 'meanings' of 'modelling' processes and 'frictions' implicit in 'labelling'. Modelling, both natural-scientific and social-scientific, is a relevant and important research area vis-à-vis geo-information systems development. There have been many attempts to model social and environmental phenomena. Modelling may be understood as the abstraction of a portion of "reality". What is the goal of such a 'modelling'? Modelling has two very different aims. On the one hand, modelling can enable a deeper understanding of society or the environment. This can be noticed from the fact that any scientific literature explaining a new method of modelling identifies itself as only a point in scientific progress indefinitely extending from the past to future, but does not claim that the particular model is the perfect abstraction of a portion of "reality". A new model can be closer to "reality" than existing ones but can never be the final goal of the overall modelling process. Models are interconnected and form a rhizome of concepts as seen in the review of researches of land use / cover change by Geoghegan et al. (1998) in which a number of modelling approaches are explained in relation to each other.

Models are also often created for the purpose of prediction. A model can be used to make an estimation of how a portion of "reality" behaves under a certain circumstances. Such an estimation is always a subject of specific interest for modellers, and often material of politico-economic interest to decision makers. Differences between a prediction made and actual developments of circumstance provide researchers clues on which to base improvements in the design of modelling procedures, and the prediction itself offers decision making communities justification to make actions and to set policies. An important point to realise is that a prediction as an outcome of modelling only lead to consequences which inspire demands for further modelling. Nobody is responsible for the relevance and consequence of a prediction, but everyone in research and decision making communities is in a position to "benefit" from a prediction. Thus, as discussed in Chapter 2 using famine models as an example, modelling is highly Foucauldian. Modelling may resemble Foucault's description of prison system, 'the despicable solution which we seem unable to do without', as quoted by Keen (1992, p64) in his

analysis of refugee camps mentioned in Chapter 4 . This point deserves wide attention from individuals belonging to research and decision making communities. It is, however, impossible to give up the apparent scientific usefulness of modelling in understanding phenomena whether the target is famine, forest or land degradation. Academic efforts to model and the politically mediated utilisation of prediction will continue. The following comment made by Foucault (1988) has relevance here.

> For a rather long period, people have asked me to tell them what will happen and to give them a program for the future. We know very well that, even with the best intentions, those programs become a tool, an instrument of oppression. Rousseau, a lover of freedom, was used in the French Revolution to build up a model of social oppression. Marx would be horrified by Stalinism and Leninism. My role — and that is too emphatic a word — is to show people that they are much freer than they feel, that people accept as truth, as evidence, some themes which have been built up at a certain moment during history, and that this so-called evidence can be criticized and destroyed. To change something in the minds of people — that's the role of an intellectual. ("Truth, Power, Self: An interview with Michel Foucault, October 25, 1983", Rux Martin in [Technology of the Self], 1988, ed. Martin et.al., Tavistock Publications)

The last word of the last sentence in this comment, an intellectual, can be replaced with a less elegant expression, an individual not as one of the little impersonal cogs in a great wheel. Criticism of the dualism of modelling which sustains the ever unchanging Foucauldian mechanism is necessary but not enough. It is also necessary to consider ways in which individuals can destroy, or take an advantage of, the dualism. The ambivalence of modelling, the contrast between its scientific usefulness and political consequence, suggests that geo-informatic products as contents of the informatic Trojan Horse, 'autonomous communication networks', need to involve functions to exhibit the process of conversion from science to politics.

Modelling essentially requires information in synoptic contexts. A member of a local community seeing an object of specific interest, a dry well for example, needs to know how the piece of information will enable him /

her to gain in the definite context related to which they find themselves or are marginalised in. The information that scientists and decision makers deal in is within 'synoptic contexts'. In other words, geo-informatic products need to have a capacity to enable individuals, both those living in the environment as well as scientists recording and analysing it, to monitor the role of models used for institutional expediency.

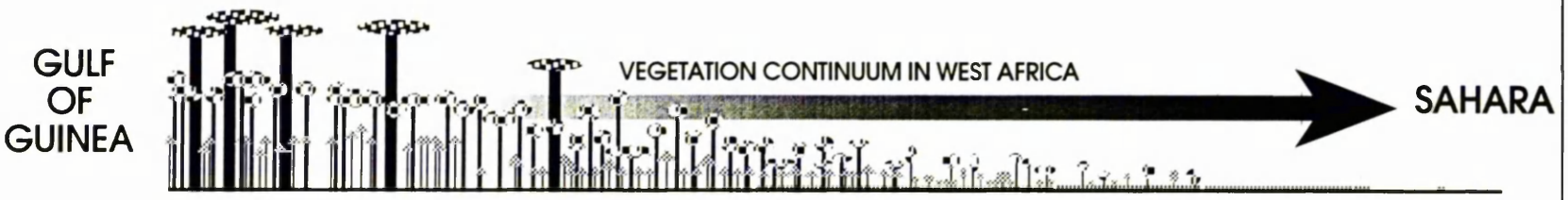
The procedure of creating a model, modelling, requires a set of labels. They are indispensable elements in a model. Human comprehension of any system requires process of labelling. Wood (1985) writes:

> Labelling occurs at different levels of social interaction. We are all labellers and so the labelled. Positions of envy and ridicule — of high and low status — are created, bestowed, occupied and deployed. All interaction requires labelling (See Goffman 1972). Labelling is used in the ranking of people according to moral proximities (Bailey 1966). Status and worth are distributed according to these and other criteria. (p7)

> A central feature of this labelling process is the differentiation and disaggregation of the individual, and the individual's subsequent identification with a principal label such as 'landless', 'share cropper' or in another context 'single parent'. Individuals are overdetermined in this way. The list of such labels can be continued more or less indefinitely. As suggested above, labels like 'refugee', 'youth' or 'woman' look inevitable, given, benevolent or natural. However, they are evidence that choices have been made between which designation of people to adopt. Remember that it is not whether, but which, by whom, under what conditions, for what purpose, with what effects! (p11)

Labelling creates roles for individuals in the Foucauldian mechanism. Power in a Foucauldian sense, that is 'networks of consensus', is ubiquitous at all levels. Horesh (1985) writes about labelling at international levels in his discourse analysis of the term 'Third World':

> The language of international relations is particularly fruitful for students of words and



HOPKINS 1974	TROPICAL RAIN FOREST	MOIST EVERGREEN FOREST	MOIST SEMI-DECIDUOUS FOREST	DRY DECIDUOUS FOREST	WOODLAND	SAVANNA WOODLAND	TREE SAVANNA	GRASS SAVANNA	(DESERT / SUBDESERT STEPPE)
FAO & UNESCO 1981	TROPICAL WET EVERGREEN FOREST (TROPICAL LOWLAND RAIN FOREST)	TROPICAL DECIDUOUS AND SEMIDECIDUOUS FOREST A. TROPICAL SEMIDECIDUOUS FOREST B. LARGE-LEAVED RAIN GREEN DRY FOREST				SAVANNA A. LARGE-LEAVED SEMIDICIDUOUS TREE SAVANNA B. MOIST SAVANNA C. DRY SAVANNA D. REED SWAMPS E. THORNBUSH SAVANNA			DESERT A. SAND DESERT B. SEMI-DESERT
POMEROY 1992	RAIN FOREST		FOREST SAVANNA MOSAIC		GUINEA SAVANNA	SUDAN SAVANNA	SAHEL SAVANNA	DESERT	
CIA 1986	TROPICAL RAIN FOREST (BROADLEAF EVERGREEN)	DECIDUOUS FOREST - WOODLAND SAVANNA					BUSH - GRASS SAVANNA	STEPPE SEMIDESERT DESERT	

Figure 6.3.1 Classification Schemes for West African Land Cover

> power. It represents the notions and preconceptions of the uninitiated as well as the 'expert': the public as well as the elite. It is the language of business and war as well as politicians and academics in the reports, newspapers, speeches and journals of the US and northern Europe. Because of the pervasiveness of business, the syndication of news and opinion and world-wide academic influence of European and American universities, the notions and the language and the labelling developed jointly by the public and the 'experts' in those countries become universal. The universal acceptance of a specialized vocabulary confers on it the respectability of a scientific language and, with it, the appearance of objectivity of description – the idea that this language with its set of labels, generated in an economically dominant culture, reveals the only possible portrayal of the relationships between nations – particularly between the industrialized capitalist membership of the OECD and the other non-socialist countries with lower per capita incomes. Thus the labelled accept the labels and with them any stigma which is part of the package. (p161)

This notion echoes the 'political economy of truth' explained by Foucault and mentioned in the introduction of Chapter 2. Labels are bricks to build knowledge, and produced by specific groups, organisations and institutions. Some of key-words used so far in this study are obviously such labels. Terms such as famine, famine victims, drought, farmer or desertification are 'generated in an economically dominant culture (ibid.)' , and contribute to 'the differentiation and disaggregation of the individual, and the individual's subsequent identification (Wood, 1985, p11)'. A point to be noted is that these labels are so fundamental in many academic disciplines that it is almost impossible for a researcher to carry out an analysis on a theme without using them.

The issue of labelling is not confined within the domain of social science but can be extended to the domain of environmental studies. What is interesting in labelling in environmental studies is that labelling seems less effective for pinning down the dynamics of environmental elements than in defining of social scientific elements. As a result, layers of labelling come into existence. The most relevant example for this study may be

the classification schemes for land cover. An item such as woody savanna or broad leaf evergreen forest in such a scheme is called a 'class' as a cartographic term, but it is essentially a 'label'. As shown by figure 6.3.1, different studies on West African land cover adopt different classification systems according to different purposes. Hopkins (1974) made an ecological classification scheme. It is a detailed scheme which may be highly useful for ecologists. UNESCO and FAO divided the land cover into four major categories and additional sub-divisions where appropriate (UNESCO & FAO, 1986). This systematic approach seems to be

Africa Seasonal Land Cover Regions Legend

1 CROPLAND WITH SHRUBLAND
4 CROPLAND WITH WETLAND
7 NONIRRIGATED CROPLAND
10 CROPLAND AND SUGARCANE AND OTHER CROPS
13 NONIRRIGATED CROPLAND
16 CROPLAND
19 CROPLAND
22 IRRIGATED AGRICULTURE
25 SHRUBLAND/IRRIGATED CROPS/TREE CROPS
28 CROPLAND/PLANTATIONS/SAVANNA MOSAIC
31 SCLEROPHYLLOUS FOREST/CROPLAND
34 CROPLAND/MIOMBO WOODLAND
37 CROPLAND/FORMER VINEYARDS/SECONDARY FOREST
40 CROPLAND/TROPICAL FOREST
43 DESERT GRASSLAND WITH CROPS
46 GRASSLAND/STEPPE AND WHEAT/SMALL GRAINS
49 CROPLAND/SAVANNA MOSAIC
52 GRASSLAND WITH ACACIA BUSHLAND
55 GRASSLAND WITH CROPLAND
58 DESERT SHRUBLAND/GRASSLAND
61 DESERT SHRUBLAND/GRASSLAND
64 GRASSLAND/SHRUBLAND
67 GRASSLAND/ACACIA SHRUBLAND
70 SPARSE SAHEL SHRUBS/SAHARA HAMMADAS
73 DESERT/FLAMMADAS/SHRUBLAND
76 ACACIA BUSHLAND/THICKETS
79 ACACIA BUSHLAND/THICKET
82 BUSHWOODLAND
85 GRASSLAND/SUDANIAN WOODLAND
88 GRASSLAND WITH WOODLAND
91 DECIDUOUS THICKET/GRASSLAND MOSAIC
94 DRY DECIDUOUS FOREST/GRASSLAND MOSAIC
97 SHRUBSAVANNA
100 MONTANE DRY SPARSE FOREST/GRASSLAND
103 SAVANNA
106 SAVANNA
109 SUDANIAN WOODLAND
112 DRY FOREST/GRASSLAND
115 OPEN MIOMBO WOODLAND
118 OPEN MIOMBO WOODLAND/SAVANNA
121 OPEN MIOMBO WOODLAND
124 SCLEROPHYLLOUS SUBTROPICAL FOREST
127 SCLEROPHYLLFOREST WITH CROPS
130 TROPICAL RAINFOREST WITH SAVANNA
133 TROPICAL RAINFOREST WITH SAVANNA
136 TROPICAL FOREST/MIOMBO WOODLAND
139 TROPICAL FOREST
142 FRAGMENTED TROPICAL FOREST
145 TROPICAL FOREST WITH SEMIDECIDUOUS ELEMENT
148 MONTANE EVERGREEN FOREST
151 MONTANE EVERGREEN FOREST
154 TROPICAL FOREST WITH SEMIDECIDUOUS ELEMENT
157 TROPICAL FOREST/GRASSLAND
160 TROPICAL FOREST/GRASSLAND MOSAIC
163 OPEN MIOMBO WOODLAND WITH GRASSLAND
166 MIOMBO WOODLAND
169 DEGRADED TROPICAL RAINFOREST
172 DEGRADED TROPICAL FOREST
175 DEFORESTED SAVANNA/MIOMBO WOODLAND
178 MIOMBO WOODLAND/TROPICAL FOREST
181 TROPICAL FOREST/MIOMBO WOODLAND
184 DEGRADED FOREST AND FOREST/SAVANNA
187 RIPARIAN/OPEN WETLANDS/SUDD
190 MANGROVES/SWAMPS, TROPICAL FOREST
193 BARREN OR SPARSELY VEGETATED
196 SAHARAN/SAHELIAN SPARSELY VEGETATED

2 CROPLAND/PLANTATIONS WITH BAOBAB/ACACIA
5 NONIRRIGATED CROPLAND
8 CROPLAND/VINEYARDS, ORCHARDS
11 CROPLAND
14 CROPLAND WITH GRASSLAND SAVANNA
17 CROPLAND WITH SCLEROPHYLLOUS FOREST
20 CROPLAND
23 SUDANIAN WOODLAND/AGRICULTURE MOSAIC
26 DEGRADED TROPICAL FOREST/CROPLAND MOSAIC
29 CROPLAND/WOODLAND SAVANNA
32 SECONDARY TROPICAL FOREST/CROPLAND
35 CROPLAND/DEGRADED FOREST SAVANNA
38 CROPLAND WITH TROPICAL FOREST
41 TROPICAL FOREST/CROPLAND MOSAIC
44 CROPLAND/SAVANNA/BUSHLAND MOSAIC
47 CROPLAND/SAVANNA MOSAIC
50 SAVANNA/CROPLAND
53 GRASSLAND/ACACIA SHRUBLAND WITH CROPLAND
56 GRASSLAND/SHRUBLAND
59 DESERT SHRUBLAND/GRASSLAND
62 ACACIA SHRUBLAND/GRASSLAND
65 GRASSLAND/SHRUBLAND
68 BUSHSHRUBLAND
71 DESERT SHRUBLAND WITH SUCCULENTS
74 SEMIDESERT SHRUBLAND WITH GRASSLAND
77 SHRUBLAND WITH GRASSLAND
80 ACACIA BUSHLAND/THICKET
83 ACACIA BUSHLAND/THICKET
86 SUDANIAN WOODLAND/SAVANNA
89 SUDANIAN WOODLAND WITH CROPS
92 ACACIA SHRUBLAND/GRASSLAND MOSAIC
95 WOODLAND/GRASSLAND
98 WOODLAND/GRASS/SHRUB MOSAIC
101 DECIDUOUS FOREST/GRASSLAND MOSAIC
104 OPEN MIOMBO WOODLAND WITH CROPLAND
107 DRY FOREST/GRASSLAND WITH CROPS
110 OPEN MIOMBO WOODLAND/SAVANNA
113 DRY FOREST/GRASSLAND SAVANNA
116 SUDANIAN WOODLAND/SAVANNA
119 OPEN MIOMBO WOODLAND/BUSHLAND
122 SEMIDECIDUOUS FOREST
125 TROPICAL RAINFOREST
128 SECONDARY TROPICAL FOREST
131 TROPICAL RAINFOREST
134 TROPICAL RAINFOREST
137 MONTANE EVERGREEN FOREST
140 TROPICAL RAINFOREST
143 TROPICAL RAINFOREST
146 TROPICAL FOREST/MIOMBO WOODLAND
149 TROPICAL FOREST
152 TROPICAL RAINFOREST
155 MONTANE EVERGREEN FOREST
158 TROPICAL RAINFOREST
161 TROPICAL RAINFOREST
164 HUMID TROPICAL FOREST
167 TROPICAL RAINFOREST
170 DENSE TROPICAL RAINFOREST
173 DENSE TROPICAL RAINFOREST
176 BUSHLAND/GRASSLAND MOSAIC
179 DEGRADED FOREST WITH GRASSLAND
182 DEGRADED TROPICAL SAVANNA WITH CROPLAND
185 TREE SAVANNA
188 DEFORESTED SAVANNA WITH CROPS
191 TROPICAL FOREST/GRASSLAND WITH CROPLAND
194 HIGH DENSITY SUDANIAN WOODLAND
197 TROPICAL RAINFOREST/GRASSLAND MOSAIC
200 MIOMBO WOODLAND WITH CROPLAND
203 DEGRADED FOREST SAVANNA WITH CROPLAND
206 DEGRADED TROPICAL FOREST/SUDANIAN WOODLAND
209 MANGROVES/SWAMPS, TROPICAL FOREST
212 MANGROVES/TROPICAL FOREST
215 BARREN OR SPARSELY VEGETATED

3 CROPLAND (PEANUTS)
6 CROPLAND (CORN/GRAINS)
9 CROPLAND
12 CROPLAND WITH GRASS
15 CROPLAND
18 CROPLAND
21 CROPLAND (RICE)
24 SCLEROPHYLLOUS FOREST/CROPLAND
27 TROPICAL FOREST/CROPLAND MOSAIC
30 SECONDARY TROPICAL FOREST WITH CROPS
33 SECONDARY TROPICAL FOREST WITH CROPS
36 CROPLAND/SHRUBLAND
39 SECONDARY TROPICAL FOREST/AGRICULTURE/PASTURE
42 SUBTROPICAL FOREST/CROPLAND
45 SAVANNA/CROPLAND MOSAIC
48 SAVANNA/CULTIVATED CROPS
51 SEMIDESERT GRASSLAND WITH SHRUBLAND
54 GRASSLAND/SHRUBLAND
57 GRASSLAND WITH CROPLAND, WETLAND
60 DESERT SHRUBLAND/GRASSLAND
63 GRASSLAND/SHRUBLAND
66 SHRUBLAND/GRASSLAND
69 SAHEL SHRUBS WITH ANNUAL GRASSES
72 ACACIA BUSH/THORN AND THICKET
75 SHRUBLAND WITH GRASSLAND
78 ACACIA BUSHLAND/THICKET
81 ACACIA SHRUBLAND/BUSHLAND
84 ACACIA BUSHLAND THICKET
87 SUDANIAN WOODLAND/SAVANNA
90 WOODLAND/HIGH VELD GRASSLAND
93 DRY DECIDUOUS FOREST/GRASSLAND MOSAIC
96 SUDANIAN WOODLAND WITH CROPS
99 OPEN MIOMBO WOODLAND/SAVANNA
102 SUDANIAN WOODLAND WITH CROPS
105 SAVANNA WITH AGRICULTURE
108 WOODLAND/ACACIA/GRASSLAND MOSAIC
111 WOODLAND/GRASSLAND SAVANNA
114 OPEN MIOMBO WOODLAND/SAVANNA WITH CROPS
117 DEGRADED FOREST/GRASSLAND SAVANNA
120 OPEN MIOMBO WOODLAND WITH CROPS
123 TROPICAL RAINFOREST
126 TROPICAL RAINFOREST
129 TROPICAL RAINFOREST WITH SAVANNA
132 TROPICAL RAINFOREST
135 MONTANE EVERGREEN FOREST
138 TROPICAL RAINFOREST
141 TROPICAL RAINFOREST
144 HUMID TROPICAL FOREST
147 TROPICAL RAINFOREST
150 DENSE TROPICAL RAINFOREST
153 DENSE TROPICAL RAINFOREST
156 BUSHLAND/GRASSLAND MOSAIC
159 DEGRADED FOREST WITH GRASSLAND
162 DEGRADED TROPICAL SAVANNA WITH CROPLAND
165 TREE SAVANNA
168 DEFORESTED SAVANNA WITH CROPS
171 TROPICAL FOREST/GRASSLAND WITH CROPLAND
174 HIGH DENSITY SUDANIAN WOODLAND
177 TROPICAL RAINFOREST/GRASSLAND MOSAIC
180 MIOMBO WOODLAND WITH CROPLAND
183 DEGRADED FOREST SAVANNA WITH CROPLAND
186 DEGRADED TROPICAL FOREST/SUDANIAN WOODLAND
189 MANGROVES/SWAMPS, TROPICAL FOREST
192 MANGROVES/TROPICAL FOREST
195 BARREN OR SPARSELY VEGETATED

Table 6.3.1 Africa Seasonal Land Cover Regions Legend
(http://edcwww.cr.usgs.gov/landdaac/glcc/afdoc1_2.html)

intended to provide a tool for development planning in the region. Classification system used by Pomeroy and Service (1986) was more concerned with a more comprehensive geographical context. Their terms such as Sudan savanna seems to imply their intention to set regional land cover in a broad continental context. The CIA classified land cover as exclusively concerned with the physical structures of vegetation covers (CIA, 1984). This simplistic approach ignored the details of the vegetation as they were presumably unimportant for military and security purposes. These different schemes only loosely correspond with each other. The variety of labels used in the different land cover classification schemes for the sub-continent, West Africa, seems to be similar to that for the whole of continent. The Eros Data Centre in US offers the 'Africa Land Cover Characteristics Data Base' (http://edcwww.cr.usgs.gov/landdaac/glcc/afdoc1_2.html). Seven land cover characteristic data sets can be downloaded from this WWW site. They were produced from 1-km AVHRR data spanning April 1992

International Geosphere Biosphere Programme
Global Land Cover Legend

01	EVERGREEN NEEDLELEAF FOREST	02	EVERGREEN BROADLEAF FOREST
03	DECIDUOUS NEEDLELEAF FOREST	04	DECIDUOUS BROADLEAF FOREST
05	MIXED FORESTS	06	CLOSED SHRUBLANDS
07	OPEN SHRUBLANDS	08	WOODY SAVANNAS
09	SAVANNAS	10	GRASSLANDS
11	PERMANENT WETLANDS	12	CROPLANDS
13	URBAN AND BUILT-UP	14	CROPLAND/NATURAL VEGETATION MOSAIC
15	SNOW AND ICE	16	BARREN OR SPARSELY VEGETATED
17	WATER BODIES		

Table 6.3.2 **IGBP Global Land Cover Legend**
(http://edcwww.cr.usgs.gov/landdaac/glcc/afdoc1_2.html)

through March 1993 (ibid.). The number of classes in each classification scheme is shown below.

197 Classes in Africa Seasonal Land Cover Regions Legend

94 Classes in Global Ecosystems

(Olson, 1994a, 1994b)

17 Classes in IGBP Land Cover Classification

(Belward, 1996)

24 Classes in USGS Land Use/Land Cover System

(Anderson and others, 1976)

20 Classes in Simple Biosphere Model

(Sellers and others, 1986)

10 Classes in Simple Biosphere 2 Model

(Sellers and others, 1996)

20 Classes in Biosphere-Atmosphere Transfer Scheme

(Dickinson and others, 1986)

Individual classes of two classification schemes from the above, 'Africa Seasonal Land Cover Regions Legend' and 'IGBP Land Cover Classification', are shown on Table 6.3.1 and 6.3.2 respectively as examples. The 'African Seasonal Land Cover Regions Legend' is not associated with any reference but explained as 'produced through the aggregation of seasonal land cover regions (ibid.)'. It is the only classification scheme specific for Africa among the seven. Other schemes were designed for observation of global land cover, and include classes irrelevant for Africa such as 'Barren Tundra' in 'Global Ecosystems'. In IGBP's scheme, there are 11 classes which are relevant and spatially significant for Africa at this scale: classes such as 'Evergreen Needleleaf Forest' is not relevant for Africa; and, classes such as 'Deciduous Broadleaf Forest' occupy only very small areas. Similarly, among the 10 classes in the 'Simple Biosphere 2 Model' scheme, 7 classes are relevant for Africa. All in all, there is a wide range of variation from a few land cover labels relevant for Africa in most of the above schemes to the 194 classes in the 'Africa Seasonal Land Cover Regions Legend'.

When we think that we are observing local communities or environments in Africa, we may be only seeing reflections of our own preconceptions. A useful discussion can be based on the above description of land cover classification schemes in currency with respect to labelling. Comparing labelling in the domain of social science and that in the domain of environmental studies, it might be possible to say that the labelled, members of societies, behave as the labelled in the former but the labelled, elements of environments, do not necessarily behave as the labelled in the latter: while 'individuals are the vehicles of power (Foucault, 1976, p98)' as they

communicate by languages in societies, elements of environments only physically interact with each other and languages can not have any effect in such interactions. This comprehension suggests that we shall gain a deeper insight into social scientific and environmental labellings used for African countries and environments. The degree of 'artificiality' within Africa is less than that in 'the industrialised capitalist membership of the OECD' using an expression by Horesh (1985, p161) as quoted earlier. Labels and consequent models are manifestations. In the economically dominant industrialised countries, "reality" is largely created by 'decisions', and environments are only entities defined as environments by societies. "Reality" almost always follows manifestations taking the form of labels and models. A forest reserve in those countries are defined and determined to be so; and, using examples from Wood (1985, p11) quoted earlier, certain individuals are defined as 'single parent' or 'share cropper' and spontaneously start behaving accordingly. Such industrialised countries paradoxically exist in artificial "reality" consisting of societies and artificially defined environments. Spatial information, both social scientific and environmental, of those "developed" countries may be similar to an architectural plan of an building in the sense that manifestation and "reality" match. Contrasting with this, in many African countries, "reality" does not necessarily accord to manifestations. Environments in Africa are not socially defined as environments, and hence layers of different schemes for labelling of land cover come into existence as observed earlier. African environments are not artificial. Considerations made so far in this study seems to suggest that it is also applicable to social scientific labelling in Africa in an uniquely subtle way. The labelled in Africa plays the role of the labelled only to a limited extent. Only in an emergency shown as a TV programme in which the "developed" countries' interventions set up by themselves to be critical, or in visions of rural development conceived by the economically dominant cultures in the North, labels such as refugee or landless can be briefly imposed on individuals of local communities in Africa.

Social scientific "reality" of Africa has, however, a tendency to escape from webs of labels. A symbolic example could be drawn from the analysis of the data used by Sen (1981) in Section 4 of Chapter 2. As quoted in that section, Nigerian statisticians Kpedekpo and Arya (1981) write:

> One main problem in population enumeration is how to record an individual, whether *de facto* (according to where he spent the night prior to the enumeration) or *de jure* (according to his usual place of residence). This problem is acute in Africa in view of frequent population movements. (p. 35)

An individual can literally stray from the label, resident. The methodologies of labelling, which has been basically developed by research communities in Europe and North America, are likely to be inappropriate in many circumstances in Africa. Members of research communities and of societies of the North, such as the writer and many (if any) readers of this study, however, live in informatic settings where 'a specialised vocabulary (Horesh, 1985, p161)' of social scientific discourses has already gained an acceptance. This situation explains why labelling seems less effective for pinning down the dynamics of environmental elements than in the fixation of social scientific elements. Labels are arbitrary and fundamentally meta-physical, but we subliminally accept them and assume that they are also applicable to physical elements. This too ready acceptance of labelling is not noticeable as far as societies and artificially defined environments in "developed" countries are dealt with. "Reality" follows social scientific and environmental labels in such countries, hence labels seem so effective. The unreasonable acceptance of labelling in Africa is also disguised by "effective" labelling in our conception of local communities in Africa in emergencies reported by the mass media or in contexts of development conceptualised in the North. Complications, or difficulty in, environmental labelling of "untamed" physical elements which do not necessarily follow our meta-physical conceptions, such as land cover of Africa, however, connotes the error in our acceptance of labelling. In other words, environmental labelling of environments in Africa reflects our preconceptions more precisely than social scientific labelling of local communities in Africa does.

The above consideration on labelling suggests another crucial consideration in designing geo-informatic products for autonomous communication networks. It is that labels created by research communities and used extensively by decision making communities as well as by the mass media, 'the syndication of news and

opinions' in Horesh's expression (1985, p161) as quoted earlier, need to be examined by the labelled. Environmental boundaries on a thematic map product, such as a land cover map, also need to be examined by individuals belonging to local communities whose existence is directly exposed to environments as wells as to decisions and policies based on the manifested boundaries.

Labelling is also significant because it produces definite contexts from information in synoptic contexts. This is self-evident from how labels are produced. Certain parameters for information in a synoptic context are chosen, certain thresholds or filters are imposed on them, and labels such as famine victims or crop drought are deployed. Labelling sets the labelled in an externally produced context. As discussed earlier, these labels are only reflections of preconceptions of the users of the labels after all. The selection of parameters and determination of thresholds and filters are driven by specific interests. Labelling is no more than a preparation for description but is taken to be definitive. Labels are inappropriate tools for sound analysis but functional for research and decision making communities to maintain. They also contribute to the Foucauldian mechanism which shackles. Those who define and use the labels as well as the labelled. By enabling individuals of local communities to examine labels set in definite contexts, liberation of not just the labelled but all active and passive users of labels can become possible. Horesh (1985, p170) mentions an alternative version of Robinson Crusoe as an metaphor to explain such liberation from conventional labels.

> In Defoe's story, that Crusoe should be Master and Friday his servant seems a natural and, once established, stable state of affairs. No European would feel any surprise that Crusoe should desire Friday to call him Master. In a modern re-telling of the tale, Michel Tounier (1984) gives the story a different twist. Once more, Crusoe comes to the Island and, imposing his own order on it, introduces scarcity. When Friday arrives, he fits easily into an already established but empty hegemony. Crusoe takes on the role of both Master and Teacher. As a result of mischievous but quite unmotivated accident, Friday destroys all the material structures which both gives his Master power and, because they provided

> 'employment', gave the relationship a justificatory rationality. The Island reverts to its natural state and Crusoe is no longer master (though that might still be his name). The two now live together as equal companions in a State of Nature. Both are liberated and Friday's example teaches Crusoe how to enjoy Life and the Island for the first time. The labels of Master and Servant had enslaved not just one but both inhabitants of the Island. We can read Tournier's fable as a metaphor of the way we think. It tells us to review how we look at the World of the Rich and the Poor and the choices that are open to us.

This interpretation of Tournier's fable is featured in the discourse analysis of the term 'Third World' written in 1985, and it seems that Crusoe and Friday represent the First and Third World respectively. As mentioned in the previous chapter, the First and Third world are losing their past significances and the Fourth World of which characteristic is social exclusion is emerging in the late half of 1990s (Castells, 1998, p164). The above fable by Tounier (1984) and its interpretation by Horesh (1985, p170), however, could be also read in a general context of the mechanism of labelling and the labelled. With such reading, the fable and its interpretation are resonant with Foucault's comment on 'the role of intellectual' quoted earlier in this section. Labels can be criticised, and destroyed. Or, at least, it is reasonable to expect that continuous disturbance of labelling systems may lead to that destruction and liberation from the frameworks imposed by the labelling. To maximize this possibility, social scientific and environmental labels need to be explicitly exhibited to individuals of local communities.

The basic strategy for designing of geo-informatic products to be used in and conveyed by autonomous communication networks, which was identified at the end of the previous section, has become more concrete in this section. The confluence of information in synoptic and definite contexts needs to be carried out in the following two ways. First, the consideration on modelling suggests that such confluence of information in the two different contexts needs to be organized in ways in which an individual can check how his or her own piece of information in a definite context is related to, woven into, or neglected in information in synoptic contexts

which constitute models. Secondly, the consideration on labelling suggests that the confluence of information needs to exhibit social and environmental labels to the labelled in order to increase the chance of them to destroy the conventional mechanism of labelling. Such attempts to enable 'checks' on the acceptability of labels are primarily challenging to the Foucauldian information flows. Checks would be very revealing because they would enable an individual to review the Foucauldian process in which pieces of information form discourses and consequently policies and actions to be imposed on local communities and environments. Geo-informatic products with the above associated checks could have effects not just on the Foucauldian but also on the Baudrillardian information flows. One possible effect would be that such geo-informatic products could be to discredit apparently truthful propaganda operated by the mass media and decision making communities. Geo-informatic products which are designed to exhibit processes of modelling and labelling to the modelled and the labelled could enable individuals to reveal intentions behind propaganda, and consequently discredit those humanitarian consumables disguised as news and reports, through autonomous communication networks.

All these effects would challenge the authority of the conventional mass media which have established themselves as an integral part of societies worldwide. Although it would take long continuous efforts to push back the humanitarian cannibalism relayed by the mass media, the number of individuals who are aware of deception of news and reports could increase. Another possible effect may be more useful in the short term middle term. It is that such geo-informatic products could enable individuals to take advantages of, or influence, the operation of propaganda. A comparison between the critical analyses of mass media by Kellner (1992), McLean (1993) and Fair (1992) featured in Chapter 3 and the backfiring of 'cruel etceteras' in the struggle of Zapatista described in the previous chapter would make such eventualities promising. While media analyses by the three researchers were fed to conventional academic channels, the guerrilla research on an American bank's internal report suggesting 'elimination' of the insurgent indigenous people in Chiapas was fed to the Internet, multi-directional telecommunication networks. The three media researches appeared to be academically interesting, but their actual effects on what they were focusing on, media propaganda, could not help but be

questioned. Contrasted with this, the guerrilla research on the bank's internal report in the case of Zapatista spread through the Internet had a significant political impact not just within Mexico but beyond. This achievement was made through their supporters', probably accidental , utilisation of mass media: The digital archive at the University of Texas (gopher://mundo.eco.utexas.edu:70/1m/mailing/chiapas95.archive/chase) shows the widely spreading criticism against the cruelty of the report was so intense that it became news on main stream mass media (gopher://mundo.eco.utexas.edu:70/0R23016-27609-/mailing/chiapas95.archive/chase). The disclosure of the report and consequent discussion through the Internet triggered an uncontrollable chain reaction in the flow of information which was normally used for operation of propaganda. With geo-informatic products based on the two notions discussed above, individuals, whether belonging to a local community in Africa or any other community, would be able to construct a persuasive argument which could redirect directions of propaganda. This effect can be a foundation for individuals to operate counter-propaganda.

6.4 Handling of data for geo-informatic products

The design of geo-informatic products for autonomous communication networks can be furthered with actual handling of existing data sets. Let us review how data can be treated in the context of consideration made in this chapter. This section aims to examine the conceptual discussions made in the pervious sections as well as to demonstrate some concrete technical criteria to be observed in developing geo-informatic products. There is an important precaution to be emphasized in the reading of this section. The data processing shown below has been a performed by an individual, the writer of this study. One may assume that a research institute with abundant human and technological resources can achieve many times what an individual with limited resources can produce. The institution might adapt itself to be able to produce such geo-informatic products. This is a simplistic and misleading idea, yet paradoxically an exploitable assumption because of its naivety. The case

studies in this section are not a sample catalogue for any sort of academic marketing. They are intended to stimulate new ideas in the individual reader's mind. Institutional adaptations to such an attempt may appear contradictory to this intention. They might, however, cause the Foucauldian system to be infected by an informatic disease. In the previous chapter, the possibility that the Internet itself may become the informatic Trojan Horse for the current Foucauldian and Baudrillardian exploitation of environments and local communities of Africa was discussed. Contents of the informatic Trojan Horse, geo-informatic products and utilisations of them by individuals, would also need to infiltrate deeply into the conventional flows of information. Personal computers were, at the beginning of their history, conceived as tools for empowerment of individuals. An individual outputting and analysing geo-informatic products by using a personal computer enjoys the benefits of this idea. Methods and findings gained from such an individual's effort could be innocently forwarded to research institutes weaving discourses for decisions and actions.

An appropriate data set to take as case study is in the 'Africa Land Cover Characteristics Data Base' mentioned in the previous section. While attempts to incorporate social scientific information into geo-informatic products for autonomous communication networks have to be made, the handling of environmental information which can be graphically expressed may be more appropriate for demonstration and discussion in this section. There are seven land cover characteristic data sets in this WWW site. They were all produced from the same remotely sensed sequential data. The original data were ascribed to different classification schemes and the seven thematic "maps" were derived. The EROS Data Centre offers those "maps" in two types of projections, Interrupted Goode Homolosine projection and Lambert Azimuthal Equal Area projection. The more conventional projection of the two, the Lambert Equal Area projection, for the Africa land cover characteristic data sets consist of 9,276 rows and 8,350 columns of pixels. A pixel is a cell containing a numeric value . An array of pixels forms an image. As explained in the WWW site, the spatial resolution of the original Advanced Very High Resolution Radiometer (AVHRR) data is about 1 km, and this resolution is retained in the processed thematic maps. Hence, the number of pixels in rows and columns of the data sets indicate the rectangular area

of approximately 8350 km (W) by 9,276 km (H) which covers the whole of the African continent, Madagascar and other surrounding areas, islands and oceans. Those thematic maps are in 8 bit raster formats. This means that the range of numeric value that each pixel can have is the eighth power of two, 256. These 256 numeric values are placed between 0 to 255. In each data set, one land cover type is assigned to one pixel value: For example, the class "CROPLAND WITH SHRUBLAND " in the 'Africa Seasonal Land Cover Regions Legend' shown in the table 6.3.1 is assigned to pixel value 1, "CROPLAND (PEANUTS) WITH BAOBAB/ACACIA" to 2, "CROPLAND (PEANUTS)" to 3, and so on. This Africa specific classification scheme, the 'Africa Seasonal Land Cover Regions Legend', has 197 classes and occupy a large part of the 8 bit range, but most of the other schemes use only a small portion. This assigning of land cover types to pixel values is very much like making a set of stencil plates. In other words, the 'Africa Seasonal Land Cover Regions' data set consists of 197 digital stencil plates, and IGBP scheme data set consists of 17 plates.

Let us download one of the land cover characteristic data sets from the WWW site. The data set with the 'IGBP Land Cover Classification' scheme may be most appropriate as it is one of the latest schemes and, unlike 'Africa Seasonal Land Cover Regions Legend' which is has as many as 197 classes, seems to have a manageable number of classes. The Eros Date Centre offers compressed and uncompressed versions of these land cover characteristic data sets. Without any compression, the size of those African land cover data sets with 8 bit pixel depth is 77.4 megabytes (MB). It can be reduced to about 3 to 7 MB with compression. In the case of the data set with the IGBP classification scheme, it is 3.2 MB. At the time of writing of this section, July 1998, downloading of the an uncompressed data set through a private dial-up Internet connection could take hours, but that of a compressed data set could be done within one hour, or even less than half an hour. Length of time to download depends on the kind of connection to the Internet. An individual having access to a fast privileged connection through institutes and organisations such as a university could reduce the length of time for downloading to a few minutes. These lengths of time for downloading are important in the sense that a too demanding a procedure of data acquisition could discourage individuals from taking advantage of what is

publicly available. As far as a data set of which size is about that of one of the compressed land cover characteristic data sets in this WWW site are concerned, there is unlikely to be a problem for downloading in most parts of Europe, Northern America and certain parts of Asia not just through a privileged fast institutional connection but through a slower dial-up connection. It is not entirely hopeless to obtain the data set even under technically very poor circumstances. Imagine that a person trying to access the 3.2 MB data set with the IGBP classification scheme from somewhere in Sub-Sahara Africa without a institutional connection. All the person needs is a stable telephone line. As seen in the previous chapter, reliable telecommunication networks are gradually becoming, available throughout Africa.

One of the main advantages of the Internet is that it offers not just data but tools for handling of various types of data. When one manages to obtain the compressed version of the land cover characteristic data with the IGBP classification scheme, the user needs to uncompress the data set. The particular type of compression used for this data set is called 'gzip' expressed as the suffix '.gz' . There are a number of WWW sites which guide how to uncompress and where to obtain tools to handle compressed files such as ones with '.gz' (e.g. 'Common Internet File Formats' at http://www.matisse.net/files/formats.html). Moreover, software for processing of data for analyses after uncompression are also available from the Internet. One prominent example for handling of remotely sensed data is MultiSpec which was developed at Purdue University (http://dynamo.ecn.purdue.edu/~biehl/MultiSpec/). It is a software for multispectral and hyperspectral imaging data, and available for downloading by any individual. These availabilities of tools are essentially products of autonomous developments of informatic infrastructures, which are extremely favourable for individuals' attempts to counter the Foucauldian and Baudrillardian flows of information. It is also noteworthy that exchanges of scientific data no longer have to go through academic channels but can be more freely achieved between individuals and institutes via the Internet.

The downloaded and uncompressed land cover characteristic data set with the IGBP classification scheme is

sufficient for the production of a conventional cartographic product showing the spatial extents of land cover types over the continent. Using the data set as a set of digital stencil plates, it is possible to colour areas of different land cover types: For example, areas of 'Evergreen Broadleaf Forest' could be filled with green, areas of 'Croplands' with magenta, and so on. It is the kind of thematic map that is often featured in an atlas for primary education. Such a thematic map is only a picture of Africa of which parts are filled with solid colours indicating land cover types. Its simplicity is similar to that of national flags in the sense that it lacks textures within and gradations between the coloured areas. A national flag is a symbol. For example, the tricolour flag of France indicates the three concepts, liberty and so on, that the country theoretically embraces. Naturally, textures within a coloured area and gradations between neighbouring coloured areas are irrelevant or redundant for a national flag. The similar graphical simplicity would have an ambivalent meaning as a feature of geo-informatic products designed to be information in autonomous communication networks. The ambivalence to be noted is as follows. On the one hand, the solid colours do not contain much information. They only define areas and, an individual looking at such a thematic map would not gain much information by relating a particular point on the map to information in a definite context from the corresponding point on the ground. The land cover of African continent can not be reduced to lines drawn for the colouring of segment. A user of such a thematic map may encounter a difficulty even in locating of a particular point of interest on areas filled with solid colours. On the other hand, however, the simplicity of the approach expresses the mechanism of labelling very well. Areas filled with the solid colours are 'manifestations'. With this notion for the ambivalent meaning of the land cover characteristic map, there are two directions in which to take the image processing. The first direction is to add textures conveying relevant information to the areas filled up with the solid colours, and the second direction is to consider gradations between different land cover types. These directions are to let geographical information in synoptic contexts come close to the perceptions of individuals who poses information in definite contexts.

Let us first consider a way to introduce texture to areas filled up with solid colours. This attempt retains the

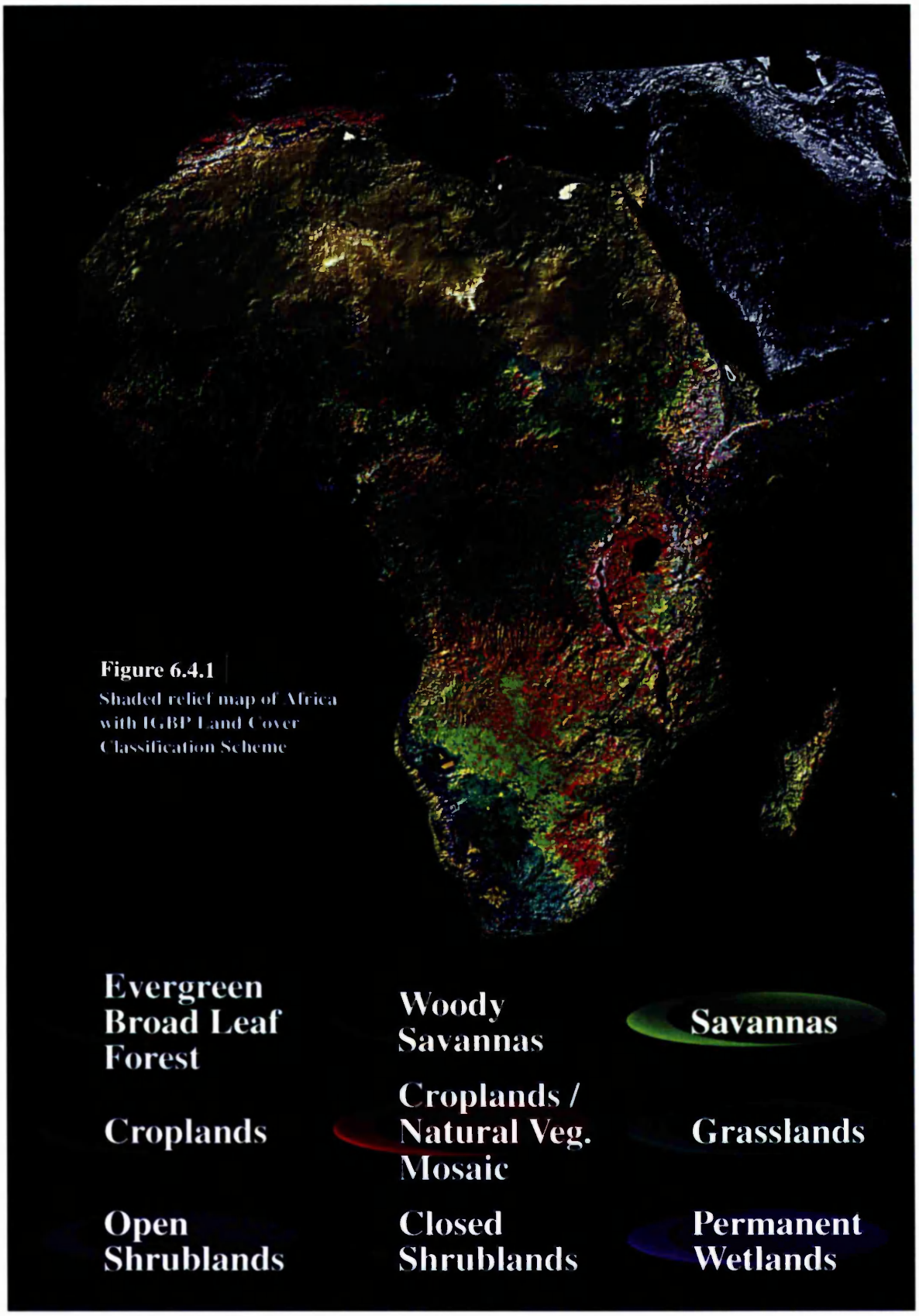


Figure 6.4.1
Shaded relief map of Africa with IGBP Land Cover Classification Scheme

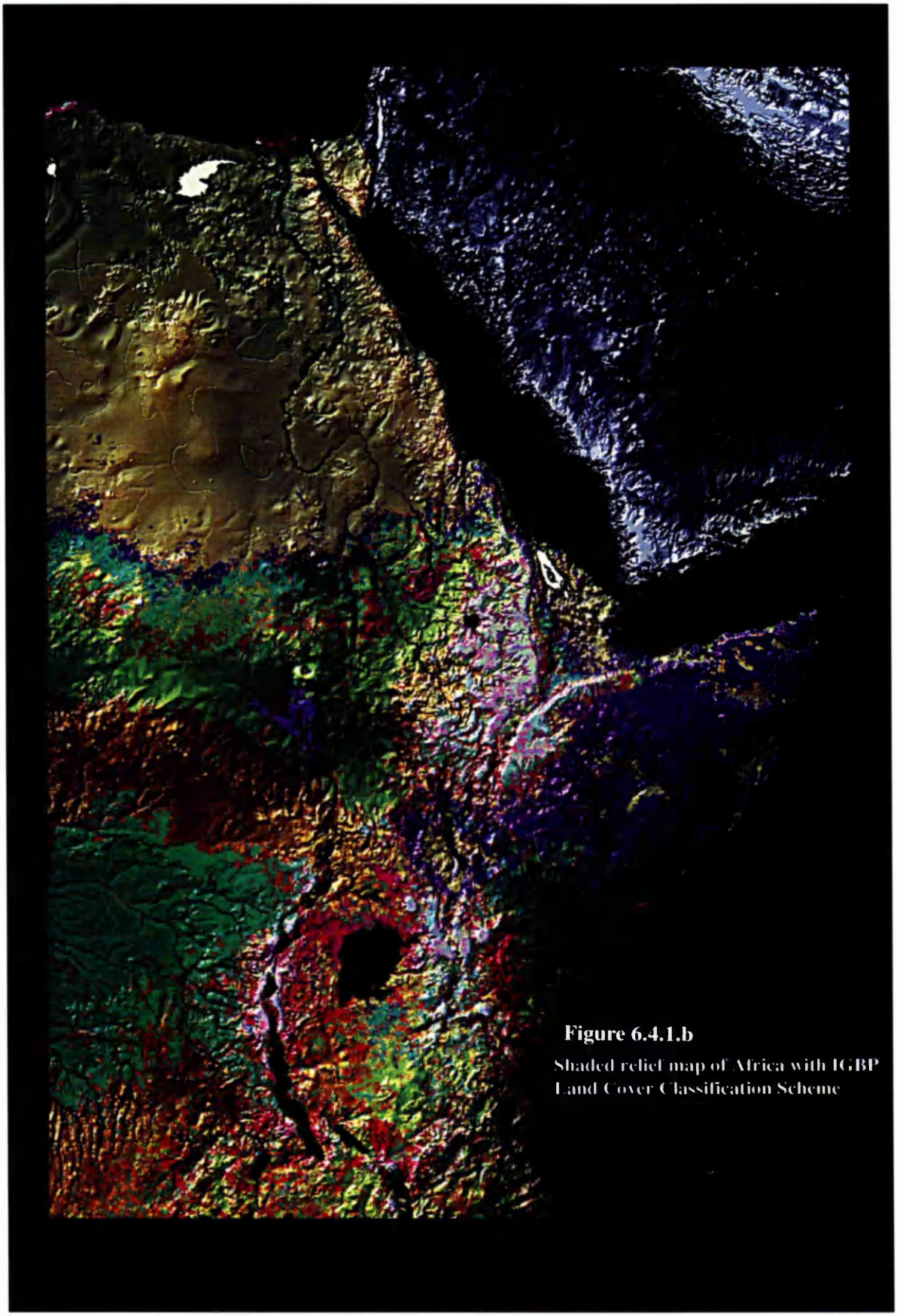


Figure 6.4.1.b

Shaded relief map of Africa with IGBP Land Cover Classification Scheme

function of the solid colours, implication of the mechanism of labelling. A way to add textures to the thematic map produced from the set of digital stencil plates is to integrate it with geo-registered elevation data. Mountains, hills, valleys and lowlands introduce unevenness to the surface of the continent. Elevation texture would make relating to the colours indicating land cover types to information in definite contexts from fields easier for users to gain impressions of two or more types of information.

The WWW site of the EROS Data Centre from which the land cover characteristic dataset with the IGBP classification scheme can be downloaded also offers a digital elevation model (DEM) for Africa. This dataset has the same projection and the same number of pixels in width and height. The only difference in format is its pixel depth. While the land cover characteristic data set consisted of 8 bit unsigned pixels, the DEM consists of 16 bit signed pixels. This means that the range of value that a pixel of the land cover characteristic data set can have is between 0 and 255, and that of the DEM can have is between -32768 and 32768: a 8 bit unsigned pixel means that the range for the pixel value 0 to the eighth superpower of 2 simply starts from 0; and, a 16 bit signed pixel means that the lower half of the range for the pixel value, 0 to the sixteenth superpower of 2, 65536, is placed in the domain of minus numbers. A DEM requires this expanded and shifted range for pixel values to accommodate a diversity of elevation. The elevation of a point in a depression can be less than the sea level, and that at the top of a mountain such as Kilimanjaro can be several thousands metres. Once down loaded and uncompressed, this DEM can be utilised for a number of purposes. For example, it can be used as a basic layer of a spatially referenced data base for Africa. In such a data base, the layer featuring this DEM would show elevation of any point of interest. For a more analytical application, drainage networks at the continental scale can be delineated through calculations of aspects of slopes derived from elevation. These utilities of DEMs are interesting branches for consideration of various types of geo-informatic products for autonomous communication networks, but let us concentrate on adding textures to the solidly coloured land cover characteristic map. The DEM for Africa from the EROS Data Centre could be used to produce a shaded relief map. The North American Cartographic Information Society (NACIS) recently developed a way to produce a

shaded relief map quickly from a DEM (http://www.nacis.org/relief/). Their recognition of this type of product is as follows.

> Cartographers often have mixed opinions about shaded relief. Although shaded relief is valued as a design option for presenting understandable and aesthetic terrain on maps, it is frustratingly difficult to produce. Heretofore, the prerequisites for creating shaded relief have been artistic talent and/or the mastery of complex and expensive software. Today, however, relief shading is undergoing democratization thanks to the accessible tools of desktop publishing. In this article I discuss shaded relief production and presentation techniques using Adobe Photoshop 4.0, the popular graphics program in which many cartographers have dabbled.

By following their guidance (http://www.nacis.org/cp/cp28/relief_tp.html) and using a image processing software mentioned above running on a personal computer, a shaded relief map indicating terrain of Africa can be produced. Using the land cover characteristic data set as a set of digital stencil plates, colours can be applied to the grey shaded relief map. An example of such a shaded relief and land cover characteristic map is shown as figure 6.4.1.

Further attempts for confluence of information in synoptic contexts and that in definite contexts can be made with the two datasets, the land cover characteristic data set and the DEM for Africa, from the EROS Data Centre. The shaded relief map showing land cover types, figure 6.4.1, is more useful than a solid colour thematic map. This integration of the thematic data set and the DEM is, however, still limited by the vertical perspective. By using 3D scenery design software, it is possible to change the angle of view on the African landscape. More concretely, unlike figure 6.4.1 where a viewer is forced to look down on the colourised Africa with terrain textures from a very high altitude, a product with which a viewer could look at the terrain obliquely as if he/she looked through a window of an aircraft. The procedure to produce such an image is as follows. First, the 16 bit singed pixel depth of the DEM needs to be rescaled to 8 bit unsigned. This is simply because most of 3D scenery design software available at the time of writing of this study only accept a 8 bit grey-scale image as

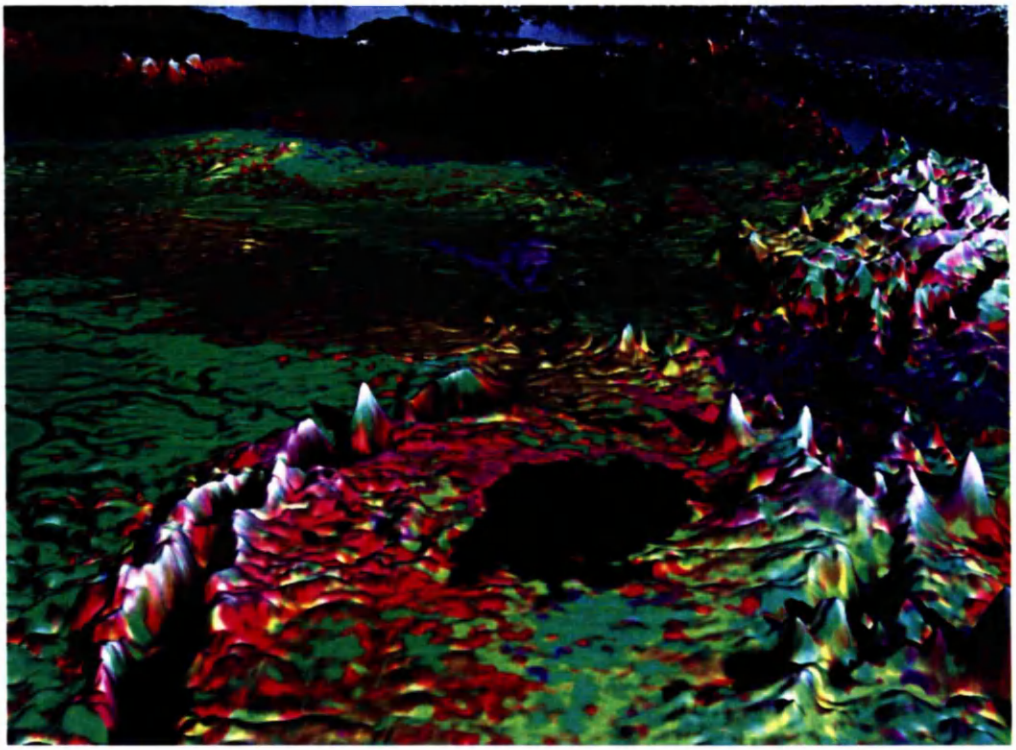


Figure 6.4.2 3D scene of the Nile Basin

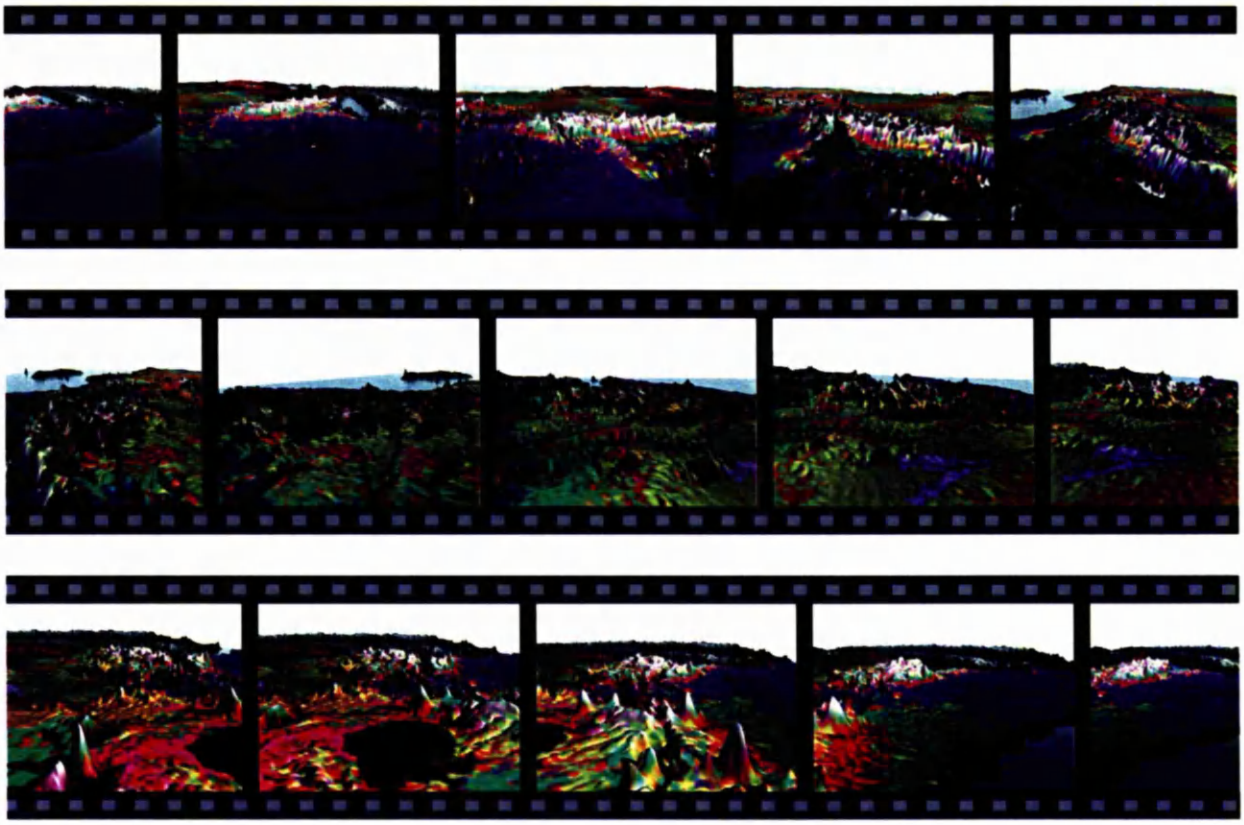


Figure 6.4.3 Some framaes from 3D Nile Basin Movie

a basis for three-dimensional plotting. By such rescaling, some accuracy of the original data set is inevitably lost, which, however, cannot be a serious problem with an oblique view angle. Moreover, the rescaling can be applied to the data set with the character of the African terrain intact, and relativity among elevations of points on the surface can be well retained. Secondly, either the solid colour thematic map or the shaded relief map with colours indicating land cover types need to be draped on the rescaled 8 bit grey-scale DEM. This procedure is straightforward, and can be normally completed within a 3D scenery design software. Thirdly, an appropriate composition of the image to be output need to be determined. This step essentially consists of trial and error. Three parameters have to be specified to determine composition: altitude of viewpoint, direction of view, and look angle in relation to the ground. It is exactly like taking a photograph in the sense that composition is fundamentally crucial. An important point in this determination process is to know what feature(s) on the ground is (are) interest(s) of users. The importance of composition suggests that the individual or team who handles information in synoptic contexts and produces such a 3D image needs to communicate with whoever is relating information in definite contexts from the ground to the 3D thematic image. Finally, a 3D image can be rendered. This process of rendering takes a few minutes to one hour by using a personal computer at the time of writing of this study. It is significantly shorter in comparison with a few years ago, and can be expected to be even more dramatically shortened in future as processing capacities of personal computers improve. An example of such a computer generated perspective on land cover draped on terrain is shown as figure 6.4.2. The colour scheme indicating the IGBP defined land cover types in this 3D image is the same as that of figure 6.4.1.

Taking advantage of available computing capacity, it could be also possible to produce a movie in which a viewer flies around terrain feature(s) of interest. This approach is very useful to determine spatial relationships of a number of features when it is difficult to arrange them effectively in one composition. Such a movie, however, has associated problems. The file size of a movie is massive in current computing circumstance. The dataset is likely to be more than a few megabytes. Although the state of the Internet is continuously improving, such a large file currently takes several hours to download and the process is likely to be too demanding for a

user without a privileged institutional connection. A current alternative may be to provide a number of still images with different view angles. An example of extracted frames from such a movie is shown as figure 6.4.3.

The quest for colour and texture discussed so far needs to be considered with respect to its relevance to geo-informatic products for autonomous communication networks discussed in the previous section. There are two points to be considered. First, the utility of geo-informatic products such as figures 6.4.1, 6.4.2 and 6.4.3 need to be considered. They are primarily for the checking of, and the generation of counter-arguments against, decisions and policies based on imposed labels and boundaries. Those products convey one central message: "Land cover types" scientifically, and hence politically, manifested are not definitive. This message has to be explicitly exhibited to individuals who would be under the direct influence of such labels.

One may, however, note a potential pitfall. Geo-informatic products such as figures 6.4.1, 6.4.2 and 6.4.3 could be simply presented as an aesthetically refined matrix for generation of discourses mimicking truth if they are not associated with an indication that they are only representations of a scientific hypothesis. Those colourful pictures could appear nicely on institutional reports and so on without fulfilling their primary objective, encouragement of individuals to carry out the examination of labels. Awareness of the Foucauldian exploitation of such information can only be achieved by making it explicit that the products are not representations of truth as clearly as possible. An explicit exhibition of labels has to be associated with an explicit indication that they are only labels. Continuos efforts to encourage a sceptical approach are essential. With this precaution, it would be feasible for individuals to let information in synoptic contexts and that in definite contexts converge. One may be able, on the basis of those geo-informatic products, to identify and emphasise what are scientific errors and what is institutional expediency. Secondly, it has to be noted that the production of the images shown in this section so far have been achieved by using datasets publicly available in the Internet. It is also noteworthy that the procedure for the shaded relief map production was also learnt from a WWW site. These points suggest that any individual with an Internet connection has a potential to produce the same kind of products. The tools used

for production were mostly commercial and had to be acquired outside of the Internet. The increasing availability of downloadable graphic and geographical data handling softwares from the Internet, such as MultiSpec developed at Purdue University, however, makes future capability more favourable for individuals with limited purchasing power and limited institutional support.

Let us now consider the issue of gradations between different land cover types. As briefly discussed earlier, a classification scheme reduces dynamics of land cover to mere symbolism. While the naming of an artificial object or feature such as 'residential block', 'national park' or 'reserve forest' is a straightforward process, naming of types of land cover involves an interesting paradox. Land cover rarely has clear borderlines in Africa. There is a word, savanna. There is another word, forest. There is yet another word, desert. It is possible to take a photograph of very "typical" and "essential" savanna, forest or desert. Boundaries between those three types of land cover, however, cannot be drawn in a definitive manner. If one travels from north to south or west to east in Africa, he / she would only see continuous gradations of ecological tone. Descriptions of land cover type, made by human beings, are not effective enough to pin down such environmental gradations on the ground. It is, however, those terms, such as savanna, are necessary in human thinking and communication, and consequently the terms are used as if they were defined incontrovertibly providing clear borderlines between separate land cover types. One may dismiss this point by assuming that it is only a matter of spatial resolution of information. Such an assumption would go as follows. If a data set with very high spatial resolution could be produced through systematic fieldworks or the utilisation of remote sensing technology, the very detailed inventory of land cover might become possible, which would solve the ambiguity of gradations between different land cover types. This assumption may look robust, but is inappropriate. Suppose that such a high spatial resolution data set shows every tree in an area. A tree does not make a woodland, nor do two trees. A hundred trees may, however. Then, what is the threshold to distinguish a woodland from a small number of trees? It is impossible definitively to specify the threshold between two and one hundred. Another impossible question is that if the one hundred trees are densely situated in the middle of non-vegetated desert, are they

significantly considered a woodland'? It depends on a context.

The paradox of gradation is related to context and to geographical scales but not to the spatial resolution of information. What is the implication of the gradation? It is that we should not expect land cover types A, B and C to exist with clear divisions in a place like Africa. Instead, what we have to contemplate is a vegetation continuum. It is tinted in multiple ways, and saturated at particular vegetation formations (e.g. lowland rain forest, Guinea savanna, etc.) and punctuated by non-vegetated sand and rock. Consideration on gradations between different land cover types inevitably leads to the recognition of the necessity to observe the continental scale vegetation continuum. This phenomenon is characterised by its seasonality which is termed by vegetation and crop phenology in ecology. The encyclopaedic definition of this term is as follows.

> Phenology:
>
> The study of seasonal changes in nature. While all natural phenomena may be included (e.g. harvest, flowering, ripening, migration, seed-time, etc.) phenological observations are often restricted to the time at which certain trees and flowering plants come into leaf and flower each year, and to the date of the first and last appearance of birds and animals.

The notion that the observation of the vegetation continuum and its phenology is important is a foundation on which to base a counter to the Foucauldian processes of conventional labelling and modelling. The behaviour of the vegetation continuum in Africa cannot be captured by solid lines defining land cover types. Hence, by providing information about the phenology of vegetation to individuals having access to ground information, the labelling of land cover can be challenged. Annual cycles of eco-systems repeat but not necessarily in the exactly same way every year, hence, by enabling individuals on the ground to access information indicating phenology of the vegetation continuum over years, modelling based on the simplistically static notion of land cover for some sort of prediction and change detection based on successive mapping could have to be disputed. In relation to gradations between different land cover types, an effort worth mentioning is the concept of continuous fields. DeFries writes:

> As an alternative to the conventional approach for describing land cover as a discrete number of land cover types, we are developing data sets that describe the land surface as continuous variables of important vegetation characteristics (e.g., growth form, leaf type, and leaf duration). Continuous variables allow more accurate description of mixtures and gradients in the vegetation. Over the past several years, we have developed a method using linear discriminants and the training data discussed above to derive continuous fields from AVHRR data. In the past year, we have applied the approach to each year in the 12 year time series of the 8km AVHRR Pathfinder record. Analysis of the interannual variability of the continuous fields indicates that the algorithm gives fairly stable estimates of the percent woody, herbaceous, and bare proportions in locations where these proportions are not expected to change.....
>
> (http://www.atmos.berkeley.edu/ids/ProgressReport98/eos.htm)

It is interesting to see the resonance between the concept of continuous fields in the above quotation and that of vegetation continuum discussed in this study. The effort being made by DeFries et al. may result in generation of more useful sources of reference for local communities, and also restrict decision making communities to abuse simplified and static labels of land cover. The concept and its application have their own scientific significance, but more importantly, if they function in the way illustrated above, they could be the first step in the drastic alteration of the current decision making process.

The procedure described in the following paragraphs are examples of the types of 'information' which can be made available to any user of the Internet. With respect to Africa and its environment, such users are currently limited to the staff of international agencies, the international scientific community, and some national and local government agencies in "developing" countries. The supply side of the information system is evolving fast. The comprehensives in coverage and detail increases every year. Now higher resolution sensor systems will provide more textured information on land surface dynamics. On the demand side, the users at the lowest level will gain

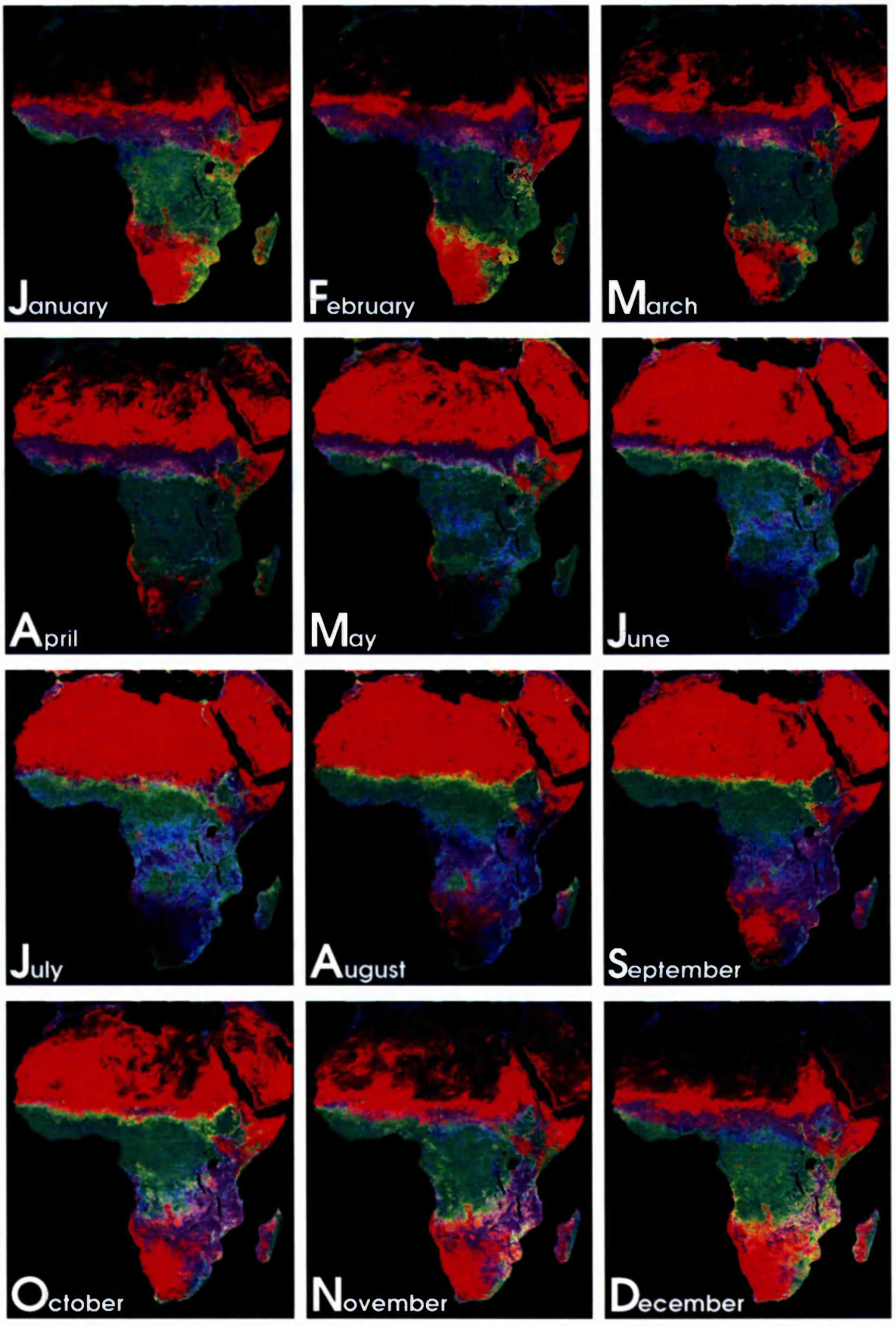


Figure 6.4.4 Sequential images of Africa showing Phenology

the capacity to know about environmental contexts. Even more importantly, they will be able to communicate their predicament via the Internet avoiding the Foucauldian and Baudrillardian traps, which prevent scientists and media professionals from distorting accounts of environmental events to fit the continued expectations of readers and viewers.

Let us examine some actual data sets. Such processed data are merely a taste of what will available in future. years time. The data sets from the 'Africa Land Cover Characteristics Data Base' offered by the EROS Data Centre are produced by applying a classification scheme to compiled monthly maximum value composites (MVCs) of AVHRR GAC NDVI data from April 1992 to March 1993. The abbreviation AVHRR denotes the Advanced Very High Resolution Radiometer which is installed on NOAA satellites. LAC denotes Global Area Coverage which means that the AVHRR's original spatial resolution 1.1 km per pixel has been retained. NDVI denotes Normalised Difference Vegetation Index. It is a numeric value indicating vegetation vigour derived from a simple formula. (Infrared Channel — Red Cannel) / (Infrared Channel + Red Channel). This formula takes advantage of spectral characteristic of vegetation. When the sunlight is available, leaves of trees and grasses photo-synthesize by absorbing visible light but reflect near infrared. In the case of AVHRR, the infrared channel is its channel 2 (0.72 - 1.10 μm), and the red channel is its channel 1 (0.58 - 0.68 μm). The AVHRR on NOAA is capable of providing two revisits per day for an area. This is a high frequency of data capture in comparison to other satellite remote sensing systems, however, persistent cloud cover in the tropics often hinders observations of the ground under them. To go around this problem, the maximum NDVI value from each pixel is compiled from data over a month and a series of images can be produced as monthly MVCs. There are a number of supervised and unsupervised classification algorithms, which are well explained in the manual of the publicly available geographical image processing software MultiSpec mentioned earlier. The WWW site of the EROS Data Centre does not explain details of the algorithm used for the production of the land cover characteristic data sets. We shall use another pre-processed remotely sensed data set to produce a product as an alternative to the land cover characteristic data sets offered by the EROS Data Centre. The data set to be used

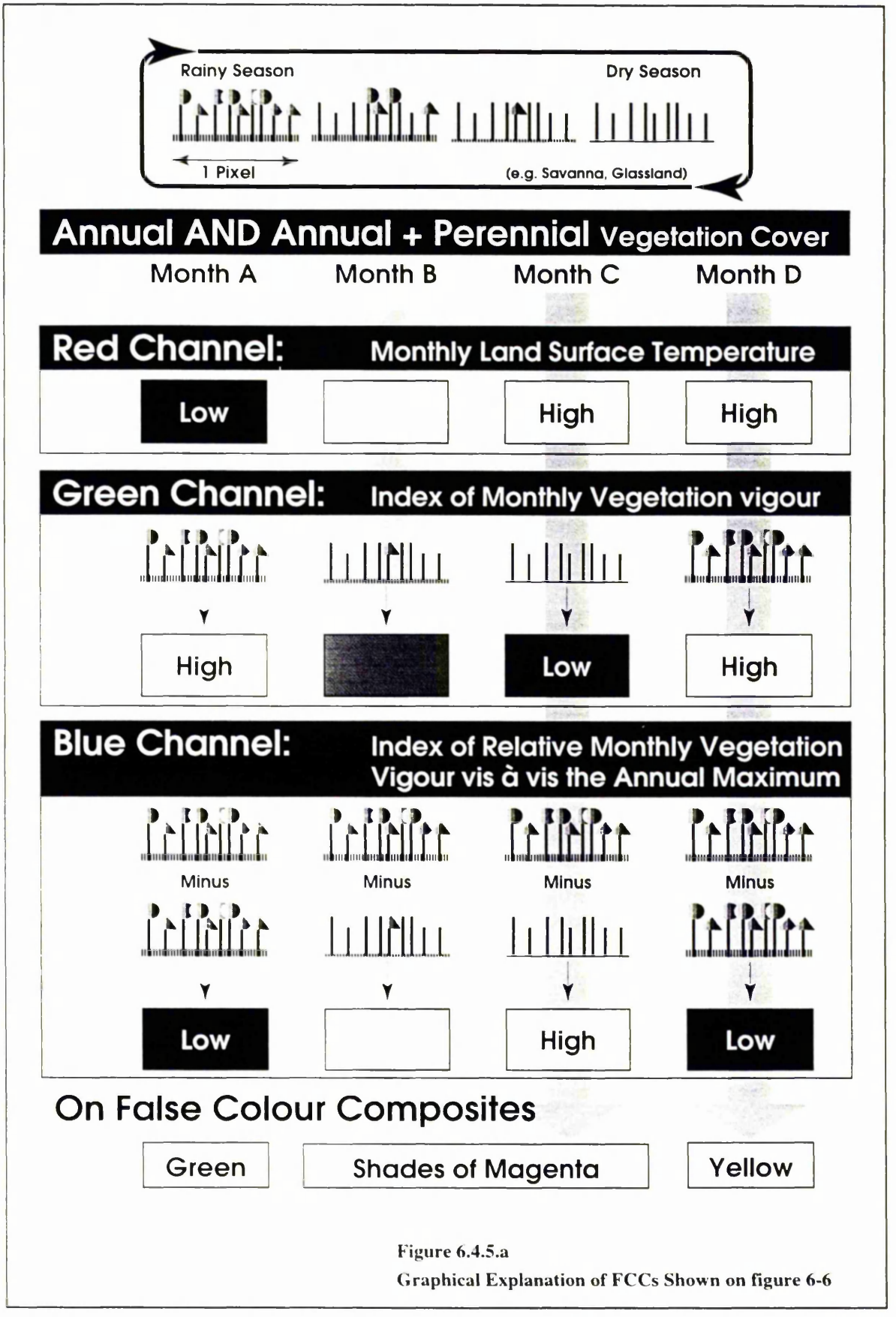


Figure 6.4.5.a
Graphical Explanation of FCCs Shown on figure 6-6

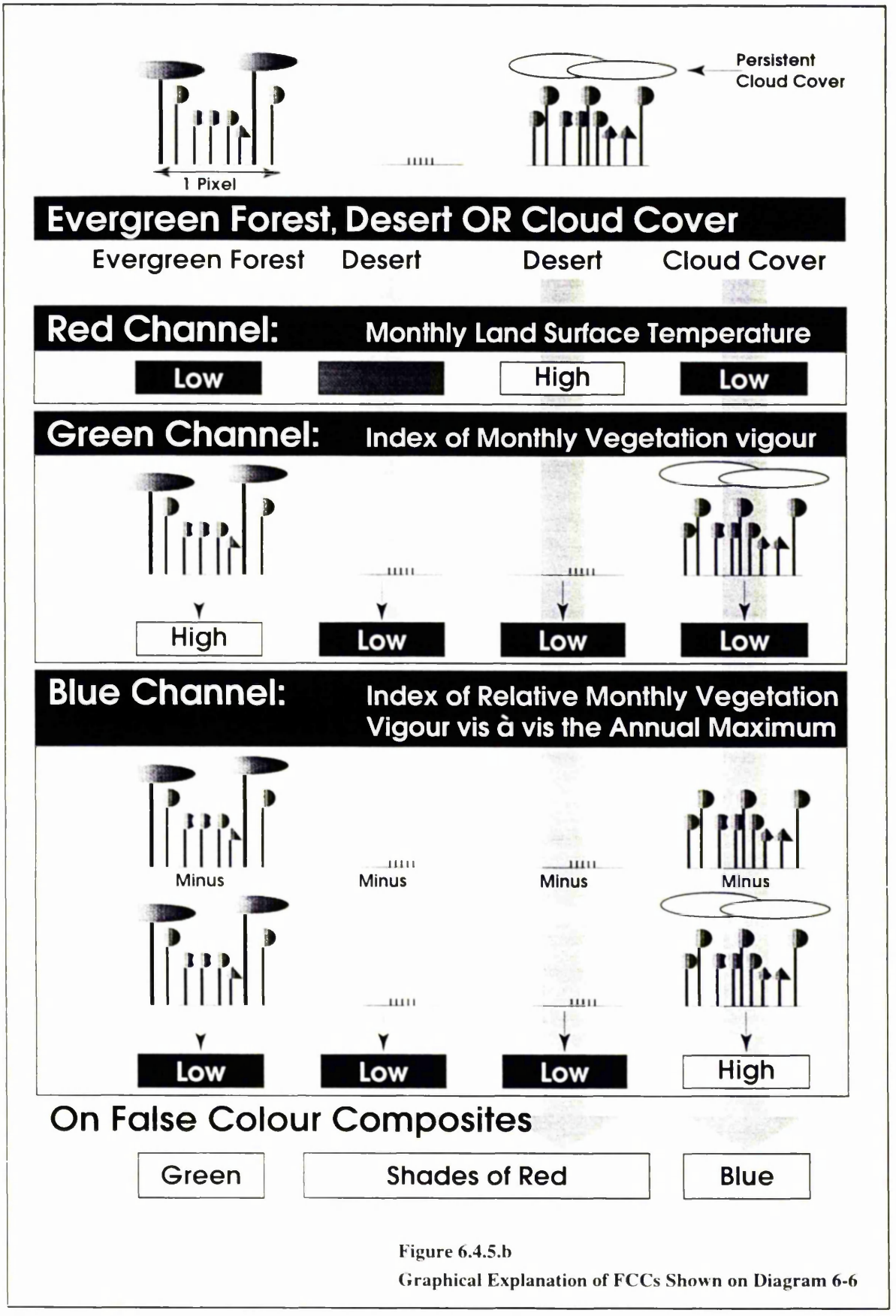


Figure 6.4.5.b
Graphical Explanation of FCCs Shown on Diagram 6-6

below was produced by the Joint Research Centre in Ispra in Italy. It is similar to that of the EROS Data Centre except in three ways. One of the differences is that its resolution is lower. The JRC data set was from AVHRR global area coverage (GAC) NDVI of which spatial resolution is 4.4 km but generally regarded as 4 km (Belward, 1991). The number of pixels in width and height of each image in data sets is 1600 and 1800 respectively. The second difference is that the projection used for this data set is the Mercator projection. The third difference is the data set contains an additional variable, surface temperature (ST). The Details of the data set are explained in article by its producers (Belward and Malingreau, 1994). 12 pairs of such monthly MVCs consisting of NDVI and LST images dated from January December in 1990 are used for the attempts below.

The overall strategy of processing in this next case is not to produce a simplistic thematic map but to produce a series of images showing the dynamics of the continental scale vegetation continuum. The most elementary way to observe the behaviour of the continuum is to display the monthly NDVI MVCs in chronological order. For a better presentation, the contrast of the NDVI images can be enhanced, and colourised by applying a pseudo colour palette. The 12 colourised NDVI MVCs put in a line is an intuitively appealing exhibition of the vegetation dynamics. A less straightforward yet more informative set of products can be produced through a compilation of the NDVI images and utilisation of the available ST images. By maximising the monthly NDVI MVCs, the yearly NDVI MVC for 1990 can be produced. The yearly MVC consists of the highest NDVI pixel values through the year, which means that the image shows the maximum extent and intensity of the vegetation continuum. By subtracting each monthly MVC from the yearly MVC, 12 useful images can be produced. Each of these images shows the extent and intensity of vegetation which was not present in the month. It is a negative of phenology of vegetation. In such a monthly negative NDVI image, areas where vegetation was seasonally absent, vigorously or moderately vegetated in other months of the year but not in the particular month, are indicated by bright, high value, pixels. If three types of images, surface temperature images, monthly NDVI MVCs, and the negative phenology image are assigned to red, green and blue channels respectively, a set of false colour composites (FCC) can be produced as shown in figure 6.4.4. Multiple gradations between different

colours indicated by figure 6.4.4 exhibit dynamism of the continental scale vegetation continuum through the year of 1990. A graphical explanation of the images shown on figure 6.4.4 is made by figure 6.4.5.a and 6.4.5.b. Annual vegetation cover on the images goes through a cycle consisting of green, shades of magenta and yellow. When such a cover, savanna for example, photosynthesises vigorously thanks to rainfall seasonally available, it is shown as green on the FCC as the corresponding pixels only in the green channel has high values. More concretely, annual vegetation covers in such a season has the following characteristics in the FCC.

1) In the Red channel

The surface temperatures of such vegetation cover are kept low as evaporation takes place at the surfaces of growing leaves (Malingreau, 1991, p268 and p270), and hence the corresponding pixels in the red channel of the FCC have low values;

2) In the Green channel

Such annual vegetation cover show high pixels values on the Monthly NDVI MVC, and hence the corresponding pixels in the green channel have high values; and

3) In the Blue Channel

As the NDVI values of such covers are close to their annual maximum values, and their subtractions from the annual maximum values result in low values of the corresponding pixels in the blue channel.

In non-growing seasons, such characteristics of annual vegetation cover on the FCC are reversed, and they are indicated as shades of magenta as the corresponding pixels in the red and blue channels have high values but not in the green channel. A more concrete explanation is as follows.

1) In the Red channel

Surface temperatures of such vegetation covers become high as absence of leaves does not cause significant evaporation (ibid.), and hence the corresponding pixels in the red channel of the FCC have high values;

2) In the Green channel

Such annual vegetation cover shows low pixels values on the Monthly NDVI MVC as their photosynthetic activities are not vigorous, and hence the corresponding pixels in the green channel have low values; and

3) In the Blue Channel

As the NDVI values of such covers are much lower than their annual maximum values, their subtraction from the annual maximum values result in high values of the corresponding pixels in the blue channel.

In the transition from a non-growing season to a growing season, from magenta to green in other words, certain annual vegetation cover briefly becomes yellow. This is because the timing of selection was different between the process of selection of monthly maximum NDVI values and that of surface temperature (ST) values. A pixel can be yellow in those FCCs when its value is high in the red and green channels. This contradicts the effect of evaporation from growing leaves explained above. Yellow pixels could, however, come into existences if the date at which the maximum ST value was taken in the month was earlier than the date at which the maximum NDVI value for the corresponding pixel was taken for the pre-processing at the JRC. The existences of yellow pixels on the FCCs paradoxically indicate rapid adaptation to seasonal conditions by those annual vegetation cover.

The colours of perennial land cover is more straight forward. Perennial vegetation cover, such as evergreen forests, are always indicated as green. The reason for this is the same as that for annual vegetation cover in the growing seasons explained earlier. Areas which are not, or only scarcely, covered by vegetation, deserts and bare soils, appear as shades from black to red. This is because such non-vegetated tracts can have high pixel value only in the red channel indicating surface temperature but not in the green and blue channels indicating the seasonal presence of vegetation. Blue pixels in certain areas on some of the FCCs are, like those yellow pixels, interestingly paradoxical. They indicate low surface temperature in the red channel, low monthly maximum NDVI values in the green channel but high values in the blue channel. It is reasonable to interpret

this paradoxical combination as persistent cloud covers. Surface temperatures of clouds cannot be very high; and, cloud cover hides existing vegetation cover on the ground, hence NDVI values become low.

By reprojecting these FCCs to match the projection of the DEM from the EROS Data Centre, or vice versa, a set of 3D images can be generated. Procedures for the production of such images are similar to those for the production of figure 6.4.2. The 12 images can be animated to observe phenological dynamics. In the light of the current, 1998, capacity of the Internet, utilisation of animation may be too demanding but that of the sets of 2D images and 3D scenes is feasible.

Implications - EO products

1. Land surface dynamics and continental information systems

The assumption that the observation of the behaviour of the vegetation continuum is crucial is only a hypothesis. This notion and the EO derived procedures may feed the Foucauldian mechanism, to become a discourse functioning as truth, and to generate networks of consensus. This conversion process from the hypothesis into a discourse is, however, unlikely to take place in the near future. Institutional obsessions with the static notion of land cover types and solid lines between them evident on virtually all of scientific and development publications would delay such a conversion. Here is room for manoeuvres to be made by individuals. The institutional obsession will keep reaching for different sets of labels and models, and decisions and actions based on them will be continuously conceived and orchestrated. Then, there will be a lot of opportunities for individuals to carry struggles into the Foucauldian flows of information.

2. Spatial resolution of EO products

The data sets discussed in this section have a relatively low spatial resolution. The one kilometre resolution of the USGS data sets and the four kilometre resolution of the JRC data set may look irrelevant for individual users acquiring information in definite contexts from fields in Africa. For example, Lake Victoria or Lake Chad can

be visible on images produced from the above data sets, but a local reservoir for a village cannot. The attempts made in this section are based on the datasets which are more or less publicly available, and high resolution data sets, especially those for Africa are hard to obtain even commercially. This notion suggests that it is necessary for individuals in research communities to weave discourses implying demands for such data sets in order to pressure decision making communities to let research communities generate them.

3. Collaboration between research and local communities on the basis of EO products

With the absence of such high resolution data sets for the foreseeable future, research and local communities need to collaborate. To actualise such collaboration, the significance of autonomous communication networks discussed in this and previous chapters cannot be over-emphasised. The other point to be considered in relation to the data processing carried out is how the approaches taken and discussions made in this section can be applied to handling of socio-economic information. All the data sets used in this section are environmental. Processing of socio-economic datasets such as population distribution of Africa has not been attempted. Environmental information can be graphically expressed and is more appropriate for technical demonstration and conceptual discussions as explained earlier. Clearly, further efforts to develop methods to handle socio-economic data sets to transform them into geographical information products for autonomous communication networks have to be made beyond this study.

Chapter 7: Conclusion

The acquisition of geographical information from Africa and the subsequent analysis of such information resemble the quest of the Holy Grail by the Knights of the Round Table. What is interesting in this allegoric composition is that some of the "Knights (some of researchers and decision makers)" have learnt that the Holy Grail is only temporary. There cannot be such a thing as the Holy Grail, there can be only Holy Grails. A theory, model or concept can become the Holy Grail for this decade or next decade just as another theory, model or concept was the Holy Grail in the last decade. The discovery of the temporary Holy Grail provides not just honour but further research opportunities, new political initiatives, and "sublime" scientific satisfaction similar to religious fulfillment, in the contemporary world. The interaction between public thirst for the Holy Grail and the union of the "Knights" whose supreme interest is in temporal benefits associated with a temporary Holy Grail is remarkable here. The union of the "Knights" generates ideas in contexts in which the public is led to believe that the action or the idea is the actual sacred Holy Grail through operations of the mass media. Such an initiative by the union of the "Knights" is always successful. The operations of the mass media, however, inevitably go beyond the intention of the union of the "Knights".

The duration of a temporary Holy Grail is shortened as the number of Holy Grails produced increases. Instead of one idea functioning as the frame of reference for a decade, a growing number of variations of the idea with a life span of a year, month or week come into existence via TV and newspapers, which saturate public perceptions. At this point, it is reasonable for one to ask a question. Can these Holy Grails be really Holy Grails to any extent? They are not. King Arthur situated above the Knights of the Round Table was able to leave the mess behind and to be sublimated by departing to Avalon. The same option is not available to local communities, however, which have been used as material for the continuous production of temporary Holy Grails by both the research communities and the mass media.

At the same time, individuals in research and decision making communities are absorbed into the mechanism of routine Holy Grail production and consumption. Now, a 'scientific theory' or 'news' is not anything more than driftwood on the ocean of indefinite probability. These ephemera do not take an individual to any solid ground. At this point, geographical information, not as an institutional tool for self-perpetual production of policies but as a process in which one individual informs his / her circumstance to another, could become an effective method of navigation to find solid ground.

In this study, attempts have been made to consider how scientific consumables taking the form of geographical information on Africa function to maintain power among communities. It also attempts to show how humanitarian consumables taking the form of news coverage relayed by mass media function to sustain the status quo. The study also demonstrates that individuals can challenge these processes. The Foucauldian structures (which dissipiate the knowledge contributed by all actors in a polity in a consensus) and Baudrillardian structures (which cause the producers of information to feed on humanitarian consumables for their own purposes without regard for the predicament of those being studied or reported on) reproduce themselves through these processes. Environments and local communities of Africa are great material for research communities to research, for decision making communities to make decisions about and to demonstrate their humanitarian policies, for mass media to mass produce news about for the public in "developed" countries who can then satisfy their humanitarian sentiments. Any challenge to the two structures would be defeated by the processes of the Foucauldian and Baudrillardian stalemates. An attempt to cause an change on the Foucauldian regime of power / knowledge would only be absorbed by it and, result in a cosmetic modification at its surface. A critical analysis of propaganda orchestrated by the mass media would only contribute to proliferation of information without making a significant impact on its target, and the humanitarian cannibalism discerned by Baudrillard would remain intact.

A possible breakthrough from these stalemates for individuals of local communities in Africa as well as those in

research and decision making communities concerned with environmental, social, economic, political and development affairs of the continent can be found through adaptation to autonomous communication networks. Such processes are being actualised on the Internet. Such networks can be understood as a form of telematics for Africa with an emphasis on autonomy. The enhancement of telecommunication in African countries is agenda issue of many governments and agencies. Fulfillment of the objective of such a project is a difficult task for any organization. Although the progress of technology keeps supplying new approaches, prospects and perspectives, the development of an effective telecommunication infrastructure cannot help being a protracted and demanding process. This, however, does not mean that telecommunications in African countries will be impossible to achieve. Many countries are deeply involved in such attempts, and gradually acquiring patches of telecommunication networks. The following two implications of the challenge of establishing telematics for individuals in and concerned with Africa can be drawn from an understanding of the state of telecommunication in Africa. First, the administrative, financial and technical capacities to develop telecommunication networks in African countries need to be continuously monitored and publicly discussed. Such efforts to fulfill this point are already made by a large number of IT professionals and experts. Secondly, geo-informatic products as traffic in telematic systems in Africa need to be designed.

As a work produced by an individual in the research community, this study could be placed in the matrix of discourse generation. It could also be transformed into academic consumables and utilised as material to produce humanitarian consumables of some sort. This possibility is a danger. The study will almost inevitably be absorbed by the mechanisms that it tried to change. Just as the Foucauldian notion of power based on a series of discourse analyses may not be more than a discourse, this study may only contribute to the cruelty of the world system. As explained in the final section of Chapter 1, the strategy of the study has been to counter such a danger by promoting the insurgent notions to a set of "innocent" academic hypotheses which will infiltrate the perceptions of individual readers. In other words, this study itself is intended to be a conceptual virus to infect readers. If a reader of this study starts throwing doubt on superficial academic and humanitarian consumables

floating at the surface of the world system and wants in future to penetrate into the structures beneath them as much as possible, the strategy can be considered to have been successful.

A final element in the strategy of this thesis to report on some important telematic and IT developments taking places in countries in Africa at the time of writing of this chapter. An instance is the increase of the number of countries having full Internet access in the past few months. The monitoring of Internet connectivity in Africa by the Southern Africa's Nonprofit Internet Service Provider (SANGONeT) was highlited. Their site (http://demiurge.wn.apc.org:80/africa/partial.html)) reported that 44 countries had full Internet access in the first quarter of 1998 as shown by the table 5.4.1. The figure is now increased to 46 with the additions of Comoros and Sierra Leone in August 1998. Mike Jensen, who is monitoring the figure, writes the following in his article dated August 5, 1998:

> The Internet has spread rapidly through Africa over the last 18 months. Two years ago only 16 countries had full Internet access, now over three quarters of the 53 capital cities in Africa are online ..... and soon almost all of the remaining capitals will also have full Internet facilities. Plans are already advanced in Gambia, Liberia, Libya, CapeVerde, Sao Tome e Principe and Somalia. This leaves only two countries that remains without any known efforts to achieve full Internet connectivity: Eritrea and the Republic of Congo (Brazzaville).
>
> (http://demiurge.wn.apc.org:80/africa/afstat.htm)

The growth of Internet connectivity is most prominent in capital cities, but rural areas are still not served. Following the observation of the capital cities, Jensen comments on rural areas:

> Services in the capital cities do not, however, provide for access by many Africans as 70% live in rural areas. Some countries (Angola, Benin, Botswana, Egypt, Ghana, Kenya, Morocco, Namibia, Tanzania and Tunisia) do have POPs in the second major city, and South Africa has POPs in about 45 cities and towns, but for most people it is still a prohibitively expensive long distance call.

> The exception to this is in Burkina Faso, Gabon, Malawi, Mauritius, Mauritania, Morocco, Niger, Senegal, Tchad and Zimbabwe which all provide local call access across the whole country. This facility is supplied by the local telecom operator which sets up a special 'area-code' which is charged at local call tariffs. It is surprising that this method has not been used more often, as it allows the ISPs to immediately roll out a network with national coverage, then as usage builds, traffic monitoring will indicate where it is more cost effective to install new local POPs. (http://demiurge.wn.apc.org:80/africa/afstat.htm)

The above observations seem to confirm the points discussed in Chapter 5. First, once Internet connectivity is given to a community, it cannot go back to the era of no connection. Rather, the network inevitably expands. Secondly, one useful feature of the Internet is that it encourages communities to demand change in bureaucratic boundaries. The method that Bukina Faso, Gabon and others have adopted, the charging of local call access rates across the whole country, as explained above, is an example of such an change.

Another instance to be reported is the recent collaboration between the National Agriculture and Animal Production Research Institute (NAARI) in Namulonge in Uganda and the International Institute of Tropical Agriculture (IITA) in Ibadan in Nigeria. These two institutes were introduced to each other through a USAID programme called AfricaLink. At the WWW site of USAID, the context of collaboration is explained:

> Scientists in many parts of Africa have long struggled to bring new seed varieties and solutions to pest problems to poor farmers. Many such scientists have studied agriculture in the halls of some of the world's leading research libraries, and yet upon returning home have been effectively cut off, forced to rely on back issues of journals that are sometimes decades old. The Internet is changing the nature of agricultural research and extension, making the world a smaller place, and improving the prospects for poor farmers across the globe. (http://www.info.usaid.gov/alnk/gallery/features/RadioEmail0798/iita.070998.html)

According to this WWW site, the process of collaboration was as follows. Researchers of NAARI in Uganda needed a specific article containing charts in a technical journal for their agricultural research. They consulted the library of IITA in Nigeria by sending an email. The IITA library searched their archive, and sent the text of the required article as an email with its graphical charts as attached image files to NAARI in Uganda. The uniqueness of this process was that the NAARI in Uganda did not have a telephone line, and the data transmission had to go through a high frequency (HF) radio link. The same WWW site as the above illustrates the path that the first email from NAARI to IITA went through:

> The scientists in Uganda sent an E-mail message to Nigeria requesting specific text and charts from a technical journal that they required for their farming research. Since no telephone line was available, their message first travelled via a high frequency (HF) radio link to Uganda's commercial center, Kampala. A private firm called Bushnet provided the radio connection. USAID's AfricaLink financed the radio equipment purchase.
>
> From Bushnet, the NAARI E-mail message then passed over the copper wires, fiber optic cables and satellites of a variety of companies before reaching its destination in Nigeria. The diversity of the companies involved in carrying the message demonstrates the complexity of the world's new interconnectedness via the Internet: the national telephone company and an Internet services firm called Infocom in Uganda, UUNET and GTE in the USA, and eventually CGNET in California, which in turn bounced the message back to Africa off of a satellite to the Nigerian telephone company and to IITA in Ibadan. Satellite space may have been leased along the way from a company like PanAmSat or perhaps INTELSAT. Transit time for the entire journey was several seconds.

The article digitised by the IITA staff followed the above path in reverse to NAARI in Uganda. This is a rather expensive and only experimental data transmission project. It should be also noted that the fact that the collaboration is now publicised in a nicely designed web page by its mediator, an aid agency, reminds us of the

De Waal's humanitarian Gresham's Law mentioned in Chapter 3 of this study: Media-aware agencies drive out not media-aware agencies. For such an experiment to be converted into a humanitarian consumable, however, implies the following two circumstances. One of these is that the technology for autonomous communication networks discussed in Chapter 5, at least, exists. If the efforts for the enhancement of IT infrastructure in African countries are continued the cost of the transmission would gradually become insignificant. The other point is, in relation to the discussion in Chapter 5, that the conversion of the experiment into a humanitarian consumable would not just let the aid agency gain interests but also promote the Internet as the informatic Trojan Horse into the current Foucauldian decision making process where local communities in Africa are marginalised. Such a manoeuvre could be further enhanced if not just articles from technical journals but more tailored geo-informatic products, such as those conceived in Chapter 6, were fed into the communication networks.

Finally, in relation to the strategy of this study conceived in Chapter 1 and outlined above, the role of the reader needs to be considered. What response can a reader of this study make? The spectrum of possible reactions to this study would be from active support to a silent denial or negation. A reader who unconditionally accepts the arguments made in this study may naturally practice the two suggestions made at the end of Chapter 5; first to promote the permanent monitoring of obstacles to IT development in African countries, and second to design of new geo-informatic products. Such responses only transform the reader into a puppet of the truth that this study mimics. As stated in Chapter 1, none of contentions in this study is truth. What the study requires is a storm of critical comment. Such contention is the only process which will initiate the essential sceptical and epistemological responses to geographical information on Africa, and the evolution of information systems which will enhance environmental management capacity and include local communities to decision making processes.

The study aimed to call down a curse upon the Foucauldian and Baudrillardian mechanisms which mislead and

ultimately impair constructive sharing of information. If it is successful, the arguments made in this study must disturb the Foucauldian and Baudrillardian workings of a reader's mind. A defensive or constructive response to the study will indicate the reader's position in the world system as well as his / her role in future. Players of a game need to be responsible for their fates. They invent their next move by themselves. At the other end of the spectrum of possible reaction, a silent negation, is less welcome than any other reaction. It would, at least, inspire a theme for the sequel of this study, however. Its title, if a silent negation is the only reaction, would be 'Connotations of silence'.

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