

CHAOS-COMPLEXITY THEORY AND EDUCATION POLICY: LESSONS FROM MALAWI'S COMMUNITY DAY SECONDARY SCHOOLS

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Abstract. Since the democratic dispensation of 1994, the education sector seems to be in perpetual transition with numerous facets of policies being introduced against a background of alleged poor management, understaffing and a poorly paid cadre of teachers. The situation was at one time likened "to a patient on a resuscitation bed in a hospital". Despite this seemingly chaotic and complex scenario, the education system has managed to survive. Using the Malawi Community Day Secondary Schools (CDSS) policy, the paper intends to draw some insights from public policy's Chaos and Complexity theory to explain why the education sector still manages to survive and show resilience (on the "edge of chaos") despite the apparent overwhelming challenges.

Keywords: education policy; Malawi; Community Day Secondary Schools (CDSS); chaos-complexity theory; participation

Table 1: Locally Generated Revenue and Total Expenditure for Thyolo and Dedza Districts

Local Generated Revenue	Council	2004/05	2005/06	2007/08 ¹	2008/09
Central government property rates	Thyolo	0	0	0	0
	Dedza	0	0	0	0
Other property rates	Thyolo	0	0	0	0
	Dedza	0	0	0	0
Income from market establishments	Thyolo	4,631,652	6,951,427	16,080,947	16,617,849
	Dedza	4,945,000	5,986,592	8,148,421	9,469,200
Income from commercial undertakings	Thyolo	183,800	207,970	1,072,992	367,332
	Dedza	875,000	700,413	468,195	1,823,520
Other fees, income and charges	Thyolo	1,171,575	3,266,998	5,045,191	1,747,307
	Dedza	1,496,000	2,505,415	3,382,650	5,070,200
Total revenue from local sources	Thyolo	5,987,027	10,426,395	22,199,130	18,732,488
	Dedza	7,316,000	9,192,420	11,999,266	16,362,920
Total Expenditure	Thyolo	20,815,154	145,174,105	405,001,389	464,793,868
	Dedza	29,219,742	148,807,689	381,163,340	425,089,026

Sources: Consolidated Local Authorities Budget Estimates for 2005/06, 2006/07, 2007/08, 2008/09 Fiscal Year

Figures for 2006/7 fiscal year missing

1. Introduction

The Ministry of Education, Science and Technology is one of the largest in Malawi and over the years it has been experiencing numerous challenges that have largely been analyzed in the academic literature (Kayuni & Tambulasi, 2007; Rose, 2003a, 2003b).^{1,2)} In order to among other things, enhance participation and improve secondary school access, Community Day Secondary Schools (CDSS) were established in 1998. However, this move led to a “crisis” in the secondary school education especially in the areas of quality and relevance of the education being provided. The available literature limits the discussion over the issue to micro policy implications; hence it does not extend this analysis to the wider system policy theory domain. The paper introduces the chaos-complex policy theory in order to contextualize this CDSS policy decision. Chaos theory argues that in most complex systems, despite a seemingly chaotic and confusing scenario, there are patterns of order which are achieved in the zone of what is referred to as “edge of chaos”- this is where they best deliver. In this case, from a casual observation, public policies applied to complex systems may be deemed to have failed when in reality there is a self-regulation scheme in operation that ultimately assists the system to deliver. On the whole, the paper argues and demonstrates that the Malawi education policies have to a larger extent driven the education system to the “edges of chaos” where it is arguably “thriving”.

In order to enhance clarity of the paper and provide a proper setting, the paper starts by analyzing the concept of chaos-complexity theory and this is followed by a discussion on the global context of education policy and reform as well as policy making in democratic Malawi. The third section analyzes the education policy in Malawi after 1994 and establishment of Community Day Secondary Schools followed by a critical analysis of the policy crisis/chaos within the Community Day Secondary School sector. Before concluding, the last section provides the underlying order within this crisis.

2. Chaos-complexity theory

Although the chaos-complexity phase in policy analysis can be traced back to some years before mid 1990's, its impact has largely been recognized in the 2000's. Taking into consideration the multiplicity of policy actors, it became clear to most policy analysts that the policy environment is more complex, unpredictable and confusing akin to chaos. However, the chaos-complexity theory gives an "appreciation, not distrust of chaos and of uncertainty, stressful times" and it further stresses that "real change and new structures are found in the very chaos they [managers or policy makers] try to prevent" (Overman, 1996).

In order to fully appreciate the relevance of chaos-complexity theory a brief analysis of the development of the concept as well as its relation to systems theory, and finally, unpredictability and crisis is discussed below.

2.1 Development of the concept

The name "chaos theory" comes from the fact that the systems described are apparently disordered, but it goes further by finding the underlying order in apparently random scenarios through its extension to analysis of complexity theory. The first person to realistically experiment in chaos was a meteorologist Edward Lorenz. While working on the problem of weather prediction in 1960, he discovered that the data produced by his computer, despite its seemingly chaotic nature, showed some patterns that could meaningfully explain certain developments. Through analysis of this data, it was revealed that a small change in the weather (which could initially be regarded as negligible) in one city can exponentially have devastating effect in another far away city (Kershaw & Safford, 1998). This was popularly known as the "butterfly effect" or "sensitive dependence". In this case, a small change in the initial conditions can drastically change the long-term behavior

of the system. Therefore, "chaos is a system theory that attempts to understand the behavior of nonlinear, unpredictable systems" (Bechtold, 1997). Originally, the concept was successfully applied in the natural sciences such as chemistry, biology and physics so as to enhance understanding of certain emerging trends in those fields. Over the years it was also noted that most social science disciplines tend to be confronted with characteristics of non-linear and unpredictable phenomenon. Consequently "this recognition has led to a surge of interest in applying chaos theory to a number of fields" (Levy, 1994) and these include international relations, economics, management, education and policy analysis.

2.2. Chaos and policy systems theory

Chaos theory is not completely new in policy analysis. Policy systems theory, which is one of the core perspectives in policy analysis, forms the basis of chaos theory. As Overman (1996) observes "chaos theory has its roots in simple systems theory and owes much to this now-familiar approach"; however, chaos theory has been developed further by generating its own perspectives to the understanding of policy processes. In general, a system is a set of parts that interact with each other and function as a unified whole. Policy systems approach argues that government or decision makers receive inputs in form of demands or support from the social, economic and political environment which they process and make decisions or policy actions which are referred to as outputs. This output may also ultimately be regarded as input through the feedback process. Policy systems approach argues that it is the goal of the system to achieve and maintain the state of equilibrium so as to ensure policy stability and progress, i.e. the inputs should balance with the output. Chaos theory, however, argues that policy stability is rarely achieved and should not necessarily be the goal of a policy system. More often than not,

policy systems are in a state of disequilibrium which leads to a seemingly chaotic situation. In this way, chaos theory is an *evolutionary* system theory.

The link between chaos and complexity is a little bit tricky as it dwells much on an abstract academic construct. This is complicated by the fact that “the literature on complexity science gives little detail to understanding “complexity” itself (Medd, 2004). This is even clear when it is noted that there is “difficulty of giving definitions and measurements of complexity” (Medd, 2004). Consequently the link between chaos and complexity has always been problematic. However, Luhmann (in Medd, 2004) argues that “we live in a world in which it is not possible to connect the totality of anything”. The link with complexity comes about because chaos “sees a system as continuously transforming itself to a higher level of complexity, making changes that are irreversible”; in this case, “though a dynamic system may appear to be chaotic, its identity, history, and sense of purpose (strange attractor) define its boundaries and guide its evolution and growth” (Bechtold, 1997). As Cohen & Stewart (1994) suggest “one of the great surprises of chaos theory is the discovery of totally new simplicities, deep universal patterns concealed within the erratic behaviour of chaotic dynamical systems.” Specifically, complexity is ultimately achieved when a dynamic system which is self-organizing (in how it orders and structures itself) grow and change.

The assumed progression in chaos-complexity theory is that a policy system starts at an optimistic level of high predictability and “as the predictability horizon is approached, however, small uncertainties will begin to creep into the system which will tend to bend or distort the rules on which we base our predictions”; ultimately “the uncertainties will be self accelerating and lead, inevitably, to a point of rapid transition into chaos” (Bechtold, 1997). The edge of chaos is somewhere between order and disorder or between a chaotic and complex situation (Cloete, 2004). According to chaos-complexity theory, this is the best scenario for an organisation or policy system because

there is a higher degree of “creativity and innovativeness” (Praught, 2004) hence the term “thriving on the edges of chaos”. Bechtold (1997) aptly describes this situation by arguing that

[A] system betters itself, creates its own future, and continuously adapts to its environment based on its intelligence and information. For this, it needs to tap not only its more stable parts but also those at the “edge of chaos” that are chaotic or even dissipative. Through the freedom of operating with an open flow of information from its “edge,” it stays connected to its simultaneously evolving environment and enhances its ability to handle environmental changes.

Table 1 summarizes the key components of the traditional, chaotic and complex policy situations as already discussed above.

Table 1. Differences amongst the traditional, chaotic and complex policy situations

Traditional policy system and rational approach	Chaotic policy situation	Complex policy situation
Control	Chaos	Complex
Order	Disorder	Order within chaos
Objective	Subjective	Interconnected
Safe	Unsafe	Dynamic
Certain	Uncertain	Adaptive
Predictable	Unpredictable	Pattern
One best way	Any way	Multiple approach
Structured	Unstructured	Codetermined
Equilibrium or homeostasis	Disequilibrium	Dissipative Structures
Holism: the whole is equal to the sum of the parts	Irreducibility	Inexplicable by the parts
Feedback	Irreversibility	Self-regulating

Adapted from Darwin (2004); Overman (1996) and Cloete (2004)

2.3 Unpredictability and crisis: the core processes in chaos-complexity

In relation to policy changes, Parsons (1995) argues “the student of public policy faces a complex and contradictory body of analysis”. Grindle & Thomas (1991) add that “all policy choices thus involve uncertainty and risk”. This uncertainty and risk is heightened by the fact public policy analysis is shrouded in what Nagel & Treaser (2004) call three methodological problems. These three methodological problems are: (a) complexity which leads to problems associated with multiple conflicting criteria and conditions of multidimensional measurement; (b) uncertainty of the consequences of current decisions; (c) effectuality or how to ably communicate in a persuasive manner hence convince public policy makers. Based on the three observations by Nagel & Treaser, uncertainty is probably the commonest problem that policy makers and analysts are confronted with. Taking into consideration the assertion by chaos-complex theory that even a small change in the policy “can have big effects that will result in unexpected outcomes as complex systems change overtime” the manifestation of a crisis can not be underestimated. Referring to change in the American policymaking, True et al. (1999) initially claim that “stasis, rather than crisis, typically characterizes most policy areas”, but they later admit that “however, crises often occur”. Embedded in this crisis is chaos. In the context of post-secondary education system in USA and Canada, Kershaw & Safford (1998) state that “chaos appears to reign” and this state will “best be understood with reference to chaos theory”.

Crisis forms a critical element in policy process and according to chaos theory, crisis ushers an institution or the policy issue to be rightly placed: on the edges of chaos. Grindle & Thomas (1991) argue that “if elites perceive a crisis...the issue will command the attention of senior policy makers” and in this case “their decisions are likely to be more radical or innovative than when a crisis does not exist, and action will often come quite

quickly". On the other hand they add that "if there is no perception of crisis, the stakes for government are lower". In relation to the education sector, this is why "the science of chaos tells us that signs of disorder might well be signs that the system of education is healthy and on its way to a much improved new order" (Sullivan, 1999).

3. Global context of education policy and reform: role of the World Bank

One of the major roles of research is that it helps guide the formulation as well as revision of any particular policy. In developing countries, there are several limiting factor to extensive research. Due to scarcity of expertise and lack of government funding, education research in developing countries is in most cases initiated and financed as well as conducted by international donor agencies- the World Bank is the leading agency in that respect (Boyd, 1999). According to Boyd (1999), the World Bank's education policy research findings have a profound "intellectual and political influence" in the developing countries. As correctly observed by King (1991), "one reason for the widespread knowledge of the research findings of the Bank is that their reports are relatively easily available at little or no cost" and in addition to this, "they constitute the state of the art". Probably of greater significance is the fact that the Bank's research reports "fill a major gap" in scarcity of educational literature "that looks across a region or continent" especially in Third World countries (King 1991).

Other influential agencies that have an influence on education policy are the United States Agency for International Development, the British Overseas Development Agency now called DFID, various UN agencies (such as the International Labour Organization, UNESCO) as well as donor countries such as Canada and Sweden (King 1991). Due to the enhanced relationship amongst the donors, the World Bank is seen as a coordinator and plays a lead-

ing role in influencing the development of educational policy (Lauglo 1996, p. 221). Above all, other donor agencies often tend to rely on the research findings of the World Bank to develop their own funding criteria (Lauglo 1996). The process of developing education policies can be said to follow three stages which are theoretical development, experimentation and finally generalisation (Ruperez, 2003). To a larger extent, the World Bank in developing countries seems to have powerful control of the theoretical development of educational policy. It is often seen in terms of "international expert." Consequently, "on some debates about education, the signals broadcast from the agency (i.e., World Bank) perspective are so powerful, it is difficult to hear the local voices at all" (King, 1991).

The notion of community participation had been advocated by the World Bank back in 1986 (Mundy, 2002). The World Bank in 1986 developed an "in-house policy note" titled *Financing Education in Developing Countries* in which three main issues were highlighted for educational reform prescription (Mundy, 2002): (1) recover the costs of higher education through user fees and reallocate these resources to the primary level; (2) develop a credit market in higher education; (3) decentralize the management of schools and *encourage private and community schools* in order to increase competition and generate a demand-side push for better quality and efficiency (emphasis my own).

Significantly, despite Mundy's (2002) remarks, these three issues have recurred (either directly or indirectly) in several other World Bank policy papers.

Apart from the World Bank, most other international organisations also encourage community participation in education. For instance, UNESCO's 1996 report, *Learning: The Treasure Within*³⁾ report emphasizes that the success of educational reforms mainly depend on local communities (including parents, school heads and teachers). The report adds that top-down

approaches have failed to bring about positive change in education hence calls for decentralisation in the education system.

However, the World Bank's policies in education have been the subject of criticism from several quarters. It is not surprising therefore that "the views of the Bank on many matters in the education sector, and on Third World economies more generally, are highly controversial" (King, 1991).

4. Policy making in democratic Malawi

Malawi's policy making process during the one-party era was highly centralized with the executive and the Malawi Congress Party (MCP) conventions taking a leading role in setting the agenda for policy formulation. Multi-party politics embraced in 1994 witnessed an opening for multiple players in the policy formulation process such as the media, NGOs, political parties etc. Although formally the Office of the President and Cabinet (OPC) has mandate to coordinate policy formulation in the country, Chinsinga (2007) observes that it is still very difficult to fully determine the specific institutional framework for policy formulation in the country. Chinsinga (2007) identifies the main actors in policy formulation as mainly being composed of the executive, the government bureaucracy, and international donors- in this case the donors are the most influential because Malawi is mainly donor dependent. An important observation made by Chinsinga (2007) is that the policy making process in Malawi is complex and tends not to follow the policymaking cycle model which is depicted in policy literature.

5. Education policy in Malawi after 1994 and establishment of Community Day Secondary School

In terms of policy, the notion of community participation in education is well entrenched through the *Malawi Vision 20:20, Poverty Reduction Strategy Paper (PRSP)* and the *Education Policy Investment Framework (PIF)* pa-

pers and the *Poverty Alleviation Paper (PAP)*. The *Malawi Vision 20:20*'s section 1.5.3 points out that one of its strategic challenges is "how to strengthen self-reliance and community participation in local development programmes". Section 1.5.10 of *Education Policy Investment Framework (PIF)* mentions that "The Ministry will thus encourage the strengthening of the participation of parents and other local stakeholders in the financing and governance of individual schools..." However, when the policy was being formulated, key stakeholders such as parents, local NGOs, Teachers, and School Committees were not adequately consulted (Rose, 2003b). Some of the objectives of the *Poverty Alleviation Paper (PAP)* are: "to improve the access of the poor to priority services and to enhance the capacities of the local communities in managing development" but in keeping with similar documents elsewhere that are part of SAP policies, little in the rhetoric suggests that the burden of payment is to be placed on the poor/rural recipients of the policy.

As already mentioned, the establishment of Community Day Secondary Schools (formerly Distance Education Centres) was seen by government policy makers as essential to broaden access to secondary school education for most primary school graduates. All government secondary schools that are centrally controlled are referred to as conventional secondary schools. However these were seen as expensive to run and they are also few in number. In order to increase the number of secondary schools so as to effectively absorb the growing number of primary school graduates, the government policy decision was to introduce Community Day Secondary Schools. Initially, the few existing Distance Education Centres were converted to Community Day Secondary Schools. Later on the communities were given the authority to construct Community Day Secondary Schools in their locality with minimal government assistance. Specifically, the official announcement in 1998 by the government/Ministry of Education, in relation to creation of Community Day

Secondary Schools was as follows: (i) all DEC's would henceforth be known as Community Day Secondary Schools (CDSSs); all CDSSs would fall under the Ministry of Education, as do conventional secondary schools, and not under the Malawi College of Distance Education; (ii) ultimately, student selection for CDSSs would be on the same basis as students to other normal secondary schools; due to time constraints the intakes for Form 1 students in 1999 would be selected by the MOE but in subsequent years selection would be phased to the district level with direct community involvement within the district in the selection process; (iii) the Ministry of Education would begin the deployment of Diploma and graduate teachers to the CDSSs; (iv) all CDSSs would be provided with financial assistance to enable them to obtain basic instructional materials packages on the understanding that communities would also contribute towards the purchase of such materials; (v) permission to open a CDSS would be granted only if MOE standards are strictly followed; (vi) standardized management and financial systems would become mandatory for all CDSS and conventional secondary schools; (vii) this move to convert the former DEC's into the new CDSSs, would have a continued emphasis on community involvement in schools.⁴⁾

As the last point in the announcement above shows, the government envisage a "continued emphasis on community involvement in schools". This is the main feature of Community Day Secondary Schools that distinguishes them from Conventional Secondary Schools.

6. Policy Crisis/chaos within the Community Day Secondary School sector

The Malawi Growth and Development Strategy (MGDS), an overarching policy document for the government of Malawi, acknowledges the various

challenges in the education sector emerging from previous policy initiatives. Specifically, the MGDS⁵⁾ states that:

[S]ome decisions which have been taken over the past few years, have negatively affected the quality and relevance of the education being provided. The sudden declaration of the Free Primary Education Policy, the conversion of the former Distance Education Centres (DECs) to Community Day Secondary Schools (CDSS) and the use of untrained and under qualified teachers in the system due to inadequate number of professionally qualified teachers, affected the quality of education at both primary and secondary levels.

In other words, Community Day Secondary School sector has been encountering serious problems, which include (taking into consideration the overlaps in education policies, some of the problems highlighted include the other educational sectors and not CDSS only): lack of community participation; poor standards/quality of education; increased dropout in the number students and decline in the number of qualified teachers; and poor housing and school infrastructure.

6.1. Lack of community participation

The establishment of Community Day Secondary Schools is meant to be largely community driven through the already existing local development projects. The government is supposed to provide the learning materials, teachers and other related resources. A study by MacJessie-Mbewe (2004a) explores the relationship between rural schools and rural communities in Malawi as well as the extent of community participation. The study reveals that “there is lack of school involvement in the communities though the communities are

greatly involved in the school development activities” (MacJessie-Mbewe 2004a). Among other studies, two studies by Rose (2003a; 2003b); see also note 2; stand out as authoritative in relation to Malawi community participation in education. From these studies it can be deduced that some of the problems that have emerged in this participatory approach include: non-empowerment of women, exploitation in the participation process, misunderstanding of the difference between participatory democracy and representative democracy and lack of clear guidance and training on participation.

6.1.1. Non-empowerment of women

The general issues of community participation in education in Africa in relation to gender is closely examined and discussed by Rose (2003a). In her study, she “examines whether community participation in education, as an end in itself, is contributing to the transformation of gender relations”. The significance of Rose’s study²⁾ is that she discusses various forms of community participation in education and their corresponding consequences. Above all, she cites examples from Malawi which persuasively demonstrate that community participation in education in Malawi, as well as Africa, regressively affect the empowerment of women. The study revealed that women do not have decision making powers in Malawian community school committees and the unintended consequence is that earlier successes on women empowerment are being progressively eroded. Although not specifically focusing on decision making itself, Maluwa-Banda (2004), also argues that the introduction of community day secondary schools has led to gender imbalance in favour of boy students. While focusing on the gender component of the policy, Maluwa-Banda’s (2004) reveals that while “significant progress has been made at policy level to introduce gender-sensitive educational policies...the main challenge has been to put the gender-sensitive policies into practice in the school management and learning.”

6.1.2 Lack of clear guidance and training on participation

Community participation largely depends on school committees. However, there is no clear guidance of what committee members are supposed to do and they also lack appropriate training (Rose, 2003a). In some cases students have failed to attend school due to inability to make development “contributions” by their parents. Parents/communities are often not involved in deciding about their contribution how the funds are to be spent. Partially funded school projects by external institutions such as MASAF do not enhance participation because the communities regard them as burdensome when they demand the communities to honour their contributions.

6.1.3 Exploitation in the “Community Participation” process

Rose (2003a) acknowledges that the terms “community” and “participation” are highly debatable, and she practically demonstrates from Malawian cases, that this lack of clarity on the definition has led to its manipulation by policy makers and implementers to achieve the intended goals. Rose’s (2003a, 2003b) studies unreservedly show that the popular notion of community participation tends to produce unintended outcomes often marked by exploitation and inequality.

Rose (2003a) argues that community school committees are not directly involved in school affairs and only limit themselves to “development work” and even in these development works, it is teachers who decide what has to be done; thus community members are not *genuinely* involved in decision-making.

6.1.4. Misunderstanding of the difference between participatory democracy and representative democracy

There is lack of interest in communities in participation of school or other development activities after the 1994 democratic elections due to a misunderstanding of the difference between participatory democracy and representative democracy. As Rose (2003a) puts it, "people feel that, through participating in elections, they have passed responsibilities for schooling to those they have elected".

6.2. Poor standards/quality of education

According to the observation made by Gwede (2004), the quality of education in CDSS (especially in Mulanje district) has significantly declined over the period from 1994 to 2004 as a consequence of the new CDSS policy. Some of the causes of this decline are attributed to lack of qualified teachers and lack of adequate learning-teaching resources. According to Craig¹⁾ most teachers in CDSS were trained to teach the primary school curriculum and they find it very difficult to handle the secondary level education. Furthermore, "some even teach subjects that they themselves did not pass at MSCE...they usually absent themselves because they are afraid of embarrassment." Although it is well acknowledged that supervision can have a positive impact on student academic achievement, it has been noted that most secondary school teachers are not supervised. According to an observation made by Kadzamira¹⁾ "even a minimum of one visit to a school per year is not being met; many schools are visited once every 2 or 3 years".

6.3. Increased dropout in the number students and decline in the number of qualified teachers

The Centre for Educational Research and Training (CERT)¹⁾ points out that the number of CDSSs students by 2004 had significantly declined by 20.9%. The main reason for the dropout is that parents and guardians are less willing to send their children to these schools which are generally viewed as of mediocre state. Apparently, when some students are selected to these schools, parents opt for particular private schools where standards are seen to be far much better than CDSSs.

Although the government mentioned that it “would begin the deployment of Diploma and graduate teachers to the Community Day Secondary Schools”, by 2000 this was largely not achieved. In general, although the number of teachers increased by 83% from 5,905 in 2000 to 10,805 in 2005, only 23% of these were qualified.¹⁾ Interestingly in CDSSs’ the number of qualified teachers had significantly decreased from 45.1% to only 7%. In 2007, of the 4,813 teachers in CDSSs, only 930 were trained (19.3%).⁶⁾

A specific case highlighting this problem is captured in an article that appeared in the *Malawi News* of 24 Feb-2 March 2007. The article entitled *Ugly face of education at Nampthungo CDSS: Two teachers man Form 1-4*, states that at Nampthungo CDSS, enrolment has plummeted just because there are extremely few teacher: two teachers only manning four classes. Some of the reasons for this shortage of teachers include lack of teachers’ houses and lack of office space. Interestingly students who had been asking for transfer “have been denied to do so and *this led to chaos*”⁷⁾ (emphasis added).

6.4. Poor housing and school infrastructure

The accommodation for community day secondary school teachers is largely in a pathetic situation which leads to poor quality of teaching services.

More importantly, the school structures themselves are often constructed by community members without serious regard to quality hence they end-up appearing as “temporary” structures. Most of them don’t have a library, recreation or sanitation facilities. A study by Volunteers Service Organization (VSO)⁸⁾ captures this scenario as articulated below:

[M]ost schools had basic infrastructure only, many were dilapidated and neglected. Typically, classrooms were old, dusty and equipped with at most a chalkboard and a limited number of desks and chairs. Often they did not have glass in the windows, and were vulnerable to prevailing weather conditions: leaky in the rainy season, stifling during hot summer months, freezing in winter. Teachers’ housing mirrored this pattern, with teachers frequently inhabiting dwellings that suffered from poor maintenance and infrastructure and lacked electricity, running water, good sanitation and cooking facilities.

7. Underlying order within the crisis

Despite the crisis and chaos in the Malawi education system as highlighted above, there is demonstration that the system is moving towards a self regulating mechanism which will ultimately create an orderly complex education system. These positive moves towards underlying order are: Decentralization of the education sector; Construction of boarding facilities for girls in some CDSS; Increase in the number of tertiary teacher training institutions; Established the Teacher Service Commission and increased programmes for teachers’ welfare; Political commitment and significant budgetary allocation to the education sector; Increased access to secondary school education; Improved management through cluster system.

7.1. Decentralization of the education sector

In order to enhance efficient and effective decision making, the government embarked on ~~an over~~ a decentralization policy in all its sectors including education. In this regard, the Ministry of education is divided into six administrative education divisions. The Southern region of Malawi has three education divisions (each division is comprised of several districts), namely: Shire Highlands Education Division; Southeast Education Division and Southwest Education Division. In the Central region, there are Central West Education Division and Central East Education Division. The Northern region has one education division called the Northern Education Division. Each division is headed by the Education Division Manager (EDM) and below him/her is District Education Manager (DEM). Furthermore, for effective administration and management, secondary schools in each division are grouped together (between 7 to 15) in what are called clusters. This comprehensive decentralization has had a positive impact on education management especially for CDSSs. Gwede (2004) supports this assertion by arguing that “decentralization of the education system is, therefore, of paramount importance with regard to the administration and management of CDSSs in Malawi.” He also adds that “It means giving the local community, thus from where pupils come, an opportunity to participate in the management of these schools.”

7.2. Construction of boarding facilities for girls in some CDSS

In order to discourage increasing drop-outs amongst girls, the government has started the construction of boarding facilities for girls in some CDSS. So far the communities have welcomed such moves and although it is too early to assess, it likely that the large drop outs that were previously witnessed will be a thing of the past. The project that started in 2007 and spent MK 800 million by June 2007, intends to build more than 20 girls hostels as a way of empowering females through education and started with the first phase

of 7 schools.⁹⁾ These hostels are going to be built in CDSSs and will be accommodating 420 female students. All this is inline with the MGDSSs' key strategy in education to "Improve the teaching-learning environment to reduce absenteeism, repetition and dropout rates for both sexes."⁵⁾

7.3. Increase in the number of tertiary teacher training institutions

Shortage of secondary school teachers has largely been attributed to limited number of tertiary institutions offering degree programmes in education. The University of Malawi was for a long time the only institution offering this degree programme (while Domasi College of education has been offering diploma programmes). Recently, the government added one public university, Mzuzu, which among other programmes, its main intake is in education. Apart from these public institutions, there has been a major increase in the number of private tertiary institutions which mainly target education courses: Lakeview College, Livingstonia University, Catholic University (although currently not fully credited, plans are underway to ensure that they are monitored by the newly instituted Malawi National Council for Higher Education). In another effort to further increase the number of qualified secondary school teachers especially in CDSSs, the government through donor funding introduced distance learning through Domasi College. In this programme, CDSS teachers who are unqualified go through a three-year distance education in various areas and are upon successful completion awarded a diploma. The programme has so far witnessed a major increase in the number of qualified teachers being deployed in CDSS. Related to this development is the government effort through assistance from USAID in capacity building for key education sectors: Malawi Institute of Education (MIE), Malawi National Examination Board (MANEB), Ministry of Education, University of Malawi and Domasi College of Education. Several officers were identified from these

institutions to undergo further training (Masters and PhD studies) and this has undertaking has greatly improved the capacity of the said institutions.

7.4. Established the Teacher Service Commission and increased programmes for teachers' welfare

Lack of teachers' welfare has been one of the main reasons why most of them have been abandoning their profession (especially at secondary school level). The government recently established the Teacher Service Commission so as to ensure that the welfare of teachers is adequately addressed. The commission is responsible for among other things the recruitment, promotion, discipline and analyzing the conditions of service of all government teachers in the country. Previously, these issues were handled by the Civil Service Commission. The problems that were commonly being experienced by teachers is that the civil service had overgrown to the extent that the welfare of teachers were being neglected or overlooked. In November 2008, the government secured a K7 billion (USD 50million) World Bank loan to construct 1,000 teachers' houses across the country.¹⁰⁾ The government also set in the 2007/2008 budget some money "to pay all arrears to teachers to uplift morale and that HIV positive teachers, numbering 3,000 would be getting K4,000 extra money each month."¹¹⁾

7.5. Political commitment and significant budgetary allocation to the education sector

The government has also showed keen interest in the development of the education sector in general. There has been a significant budgetary allocation to the Ministry of Education such as a 14.1% of the total national budget in 2007/8 and 12.5% for the 2008/9 period.¹⁰⁾ And in 2008 alone, 30 CDSS have been targeted to be provided with libraries, teachers' houses and science

laboratories.¹⁰⁾ This is a major breakthrough for the CDSS that have dilapidated and archaic infrastructure. In the State of Nation Address in May 2008 under the theme, "Malawi: A Nation of Achiever", the President recognized the important role that education plays in national development. Among other things, he promised: upgrade teachers to Diploma, Bachelors or Masters degree levels; and construct hostels at 10 girls secondary schools.¹²⁾ In the 2007/8 budget, the government set apart some funds "for hardship allowances for teachers as a way of luring them back in public schools."¹¹⁾

7.6. Increased access to secondary school education

Although MacJessie-Mbewe (2004b) argues that the introduction of Community Day Secondary Schools has not adequately helped to address the question of secondary school access in Malawi, the available data shows otherwise. Enrolment in DEC's in 1998 (just before they became Community Day Secondary Schools) was 132,455 and 1999 after the introduction of the new policy, the enrolment increased to 166,781. Gwede (2004) notes that the largest number of the pupils in secondary schools is enrolled in CDSSs

7.7. Improved school management through cluster system

Trigu (2004) investigated on the impact of Malawi Secondary School Cluster System (a form of decentralised system of school management) on the management of CDSSs in Blantyre district. Trigu (2004) found that the cluster system brought about visible and positive changes in the management practices of CDSSs. Some of the indicators of this improved management include availability and management of school records, sound financial management practices, improved supervisory skills as well as improved community participation. In relation to community participation, Trigu defines it in the context of the Parents-Teachers Association (PTA). In order to measure community

participation he focused on two indicators: the extent to which the PTA assisted the school projects as well as disciplining of students.

8. Conclusion: lessons from chaos-complexity theory in the Ministry of education's CDSS policy

It can be deduced that the education policy of introducing CDSS was followed by a crisis in the sector as evidenced by poor quality and irrelevance of the education being provided. However, confirming the chaos-complexity theory, the education system has not been passive as it has witnessed a re-emergence of several innovative ways of solving the said crisis. This concurs with Kershaw & Safford (1998) who argue that "this ability to deal with complex and dynamic natural systems suggests strongly that chaos theory has the ability to reveal the underlying regularities in the emergent relationships between educational providers and their student". Specifically, some of the lessons learnt from underlying regularities in the education sector emerging from chaos-complexity theory can be summarized as followed.

First, there is a notable innovativeness in the education system. Most of the education programmes that the government is currently engaged in are response to the free-primary education policy and subsequent creation of CDSS. Without the creation of CDSS probably these positive outcomes couldn't have emerged; such as establishment of the Teacher Service Commission and introduction of cluster system.

Second, more and more CDSSs are being established in the country (thus increasing access) and each school being established takes into consideration the lessons and observations made on other previous schools. Ultimately, improved quality of education will be attained.

Third, the earlier education crisis led to an increased number of private and NGOs partnering with government in the area of education examples are GABLE, Civil Society Coalition for Quality Basic Education etc. In addition,

there are now more opportunities for context specific education policy implementation within the said decentralized sector.

Fourth, unlike in the past, there is an increased public interest, awareness and participation in the education sector. This general public interest/debate on education policies is mainly generated by the socio-political controversies surrounding the education policies themselves. The media has also significantly contributed to this debate.

Finally, since the Education Act of 1962, there was no strategy for community participation but recently there has been a development of a *National Strategy for Community Participation in School Management*. One possible factor for the development of this strategy is the general chaos that ensued soon after the implementation of free primary education and CDSS policy.

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