

## **Strengthening Community Flood Resilience Through Local Partnerships in Sudan: the Case of Sudanese Red Crescent Society and Private Sector Initiatives**

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### **1.1**

**Preface:** The Sudan with an area of 2.5 million square kilometers lies between latitudes 30° 53' N and 21° 55' N and longitudes 21° 54' E and 38° 30' E. It is a country of vast plains interrupted by a few widely separated groups of hills or mountains, namely the Red Sea Hills in the east, Marra Mountains in the west the Immatongs and Nuba Hills in the south. The country is divided from south to north by the River Nile. Rainfall decreases gradually from south to north. It varies from a maximum of approximate 150 cm in the semi-equatorial climate in the south to about 15 cm in the northern borders of the dry region and to less than then 10 cm in the desert region (Hayati *et al.*, 2005).

According to the results of the 1993 census the total population of the Sudan are 25.6 million people, 82% of whom live in the northern part of the country. Total manpower is 8.3 million and unemployment is 11.4%. there are 1.2 million displaced and approximately one million refugees.

### **1.2 Flood Disaster Profile in Sudan:**

The Sudan is considered as one of the most disaster-hit countries in Africa during the last 40 years. It suffered from a number of natural disasters namely drought, floods, famines, pests, epidemics, fires, and plant diseases. The country has also suffered and is still suffering from politically motivated violence that started in Southern Sudan in 1955 and ceased for 10 years i.e. 1972 -1982. Available data indicates that between 1965 and 1990 the number of individuals killed was 420 thousand and about 34 million were affected and approximately 1.75 million lost their homes as of natural disaster (Hayati *et al.*, 2005).

Most of the Sudan falls within the African Sahelian Belt "coast fringe", which is periodically affected by drought and floods, as a ramification of

the it's high variability of rainfall in both; time and space. The drought has become severe during the past four decades. Severe drought affecting Sudan were in 1886, 1967-1937 and 1980- 1984. The first recent drought period started in 1969 and reached its peak in 1973: the second one started during the 1982/83 periods. During the 1982/ 83, 1983/84, 1984/85 and 1987/88 periods agricultural production was very low, the most severely affected states being Grater Darfur, Grater Kordofan and the Red Sea State. These States are already characterized by chronic malnutrition, though it is common every- where in the Sudan.

Flood disaster is caused by two different phenomena: localized exceptional heavy rainfall and run off, and the Nile river system over flowing peak boundaries and carrying higher than usual sediment loads. Floods in both forms are highly unpredictable mainly due to the varying frequencies and intensities of rainfall.

The River Nile is the main source of flood disaster in the country in terms of magnitude, frequency, and damage. Flood damage is concentrated on agriculture along the Nile and includes crop loss, destruction of irrigation infrastructure and loss of and damage to pumps and machinery, loss of and damage to houses, schools, and other establishments and occasional loss of lives. The main severe floods recorded for the Nile were in 1878, 1946, 1988, 1994, 1996, 1997, 2001, and 2003.

In 1988, as Sudan was getting used to relatively normal conditions, unusually heavy rains in all parts of the country resulted in the major flooding of many areas of the country, especially those along the Nile. The flood caused substantial damage to houses, land and agriculture as well as the loss of many lives. In Khartoum alone, an estimated one million houses were reported to have been damaged. The 1988 floods caused 10 times more damage than the 1946 one, which was the worst flood in the last century (Abu Sin, 1991).

Areas around the River Nile and its tributaries are most susceptible to damage by floods. These include Northern, Nile, Khartoum, Gezira, and Eastern state. Kordofan and Darfur states are most susceptible to flood by rains. Gash stream is the main source of damaging floods outside the Nile system.

Due to heavy rains during 2001 and 2003, disastrous floods hit the northern part of the Sudan. Although in recent years flooding has occurred regularly in Sudan, the most recent flood has been the worst to affect the country in the past twenty years. This was caused by unexpectedly early heavy rains, causing large-scale displacement of

families, destruction of homes, crops and livestock, mosques and entire villages.

In the 2001 flood more than 62.000 people in nine states of Sudan lost their homes. The worst affected states of the country were River Nile state to the north of the capital Khartoum and Sinnar and Gezira state to the south of Khartoum. Although the immediate risk to the population gradually diminished, the situation continued to be hazardous for a long period, with a reported increase of waterborne diseases, as well as chest and eye infections.

The Gash flood of 2003 in Kassala, in addition to the destruction of a large number of buildings, also destroyed most of the pit latrines of the town. The vast majority of the flood victims (100,000 people) are poor: they live in flimsy housing, their farms and settlements are located in high-risk areas, they have limited access to information and the lack of assets puts constraints on the development of effective coping strategies (Hayati. 2003).

Government, international humanitarian NGOs, and local communities have been involved at different levels and with different capacities in disaster preparedness, mitigation, and response and recovery activities. Sudanese Red Crescent, in partnership with the ProVention Consortium, is playing a crucial role in flood disaster risk reduction in Sudan.

### **1.3 Objectives:**

The objectives of this research are to:

1. Determine concrete ways to involve private sector business in disaster management related service of the SRCS.
2. Provide an overview of existing linkages/contacts between SRCS/ civil society actors on the one hand and private companies in Sudan on the other hand in the humanitarian field in general and in the field of risk reduction in particular.
3. Document the direct and indirect damage caused by floods to these businesses, their work force and premises, and .
4. Study the interests in these private companies in increasing collaboration in the field of flood disaster risk reduction and mitigation activities with the SRCS Flood Disaster Risk Reduction Project.

#### **1.4 Methodology:**

To achieve the above-mentioned objectives the methodology used in this paper is based on the following:

1. The Sudanese Red Crescent Society and the following private sector companies were selected as case study: Coca-cola, Mobitel, Shell, Barbary for Transport, Gum Arabic, and, Climax for Drugs.
2. A comprehensive questionnaire was designed addressing the above mentioned private sector companies to cover the following issues: background, role in socioeconomic development, flood impacts on company production, disaster mitigation, ways of collaboration, suggestions for collaboration strategy.
3. The questionnaire was associated with an in-depth interview sheet carried out by interviewing stakeholders and managers of the above mentioned companies. This sheet developed the same contents of the questionnaire.
4. The research's information has been presented in four main parts. Part one an introduction includes flood disaster profile in Sudan, objectives and research methodology used is given. A theoretical framework on Vulnerability to flood disasters and the role of private sector in developing flood risk reduction policies, strategies and plans are presented in Part two. Part three deals with the Sudanese Red Crescent Society Flood Disaster Risk Reduction Project and the private sector companies. The research findings are presented in Part four. Part five provides the conclusion.

#### **2. Theoretical Framework:-**

##### **2.1 Vulnerability to flood Disasters:**

One of the early discussions on vulnerability was provided by Chambers (1989). He started from the properties of the system which gave to vulnerability rather than the specific empirical forms. He defines it as: "The exposure to contingencies and stress and difficulty coping with them". Based on his work, deep analytical criticism has been made by Downing *et 81.*, (1996). They define it as: "An aggregate measure of human welfare that integrates environmental, social, economic and political exposure to arrange of potentially harmful perturbation or threats". They divided it into two types: an external side of risk, shocks and stress, to which an individual or household is subject; an internal side which defenselessness, meaning a lack of means to cope without damaging loss.

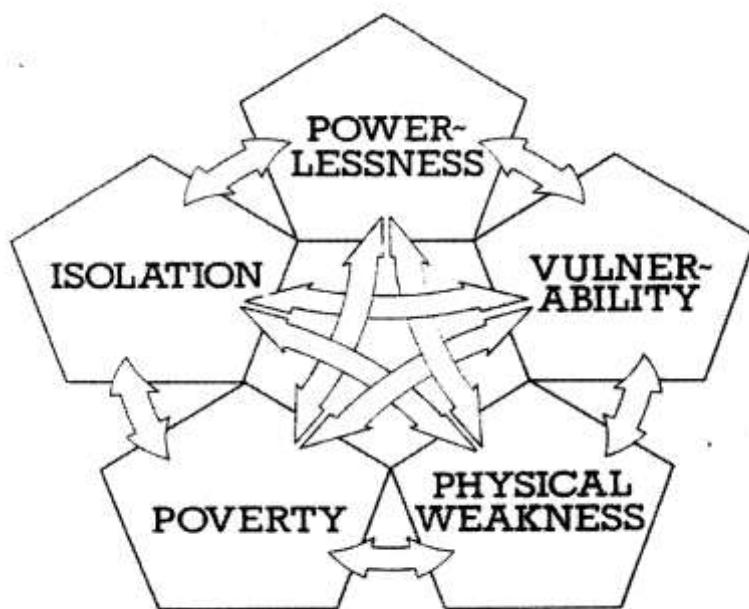
This definition suggests three basic co-ordinates of vulnerability or three sorts of risk vectors: the risk of exposure to crises (flood crises), stress and shocks; the risk of inadequate capacities to cope with the stress, crises and shocks and the risk of sever consequence of and the attendant risks of slow or limited recovery from crises and shocks.

Towards a better understanding to the above mentioned notions, the meaning of the key words, in the both definitions have to be more clarified; e.g.; exposure and potentiality. Vulnerability can be defined in terms of exposure, capacity and potentiality (Blaikie, *et al.*, 1987; Andersen *et al.*, 1989). While capabilities can be defined as "the abilities of people to undertake valuable doings and beings; formally, this is a- set of functioning entitlement bundles representing the various alternatives doings and beings that a person can achieve with his \her specific characteristics" (Drèze and Sen, 1989). The entitlements, in this case, extended to include the results of more informal types of rights sanctioned by accepted notions of legitimacy.

Potentiality of such groups shows and reflects the level of exposure, which is difficult to be majored or exactly determined (Doglas, 1992). Potentiality is the bundles representing the various alternatives doings and beings that a person can achieve as it has been determined by Drèze and Sen, (1989). The capacity of each society can be seen through the way the society is governing and controlling the environment, using its bundles. In other words, it is an internal power of the society (socio-economic and political), which is used, not only to cope or adapt with crises, stress and hazards, but also to achieve a satisfactory level of disaster preparedness. Yet, the exposure refers to the construction of social economic and political factors that place a specific population at-risk (Downing *et al.*, 1996).

Vulnerable community's role in flood disaster risk reduction, in developing countries, should be talked in a wide prospective which enable to analyses their actual situations. In his book "Rural development Butting last first" Chambers has examined vulnerability with deep integrated analysis. He goes further than saying that people are vulnerable because they are vulnerable; but he described it as a vicious circle and he links five clusters: (1) powerlessness; (2) vulnerability; (3) physical weakness; (4) poverty, and; (5) isolation (Fig. No.1). He thinks poverty is a strong determinant of the others and it contributes to physical weakness through lack of food, small bodies, malnutrition, leading to low immune response to infections and inability; to isolation

because of the inability to pay the cost of schooling or afford to travel to look for work; to vulnerability through lack of assets to meet contingencies; and to powerlessness because lack of wealth goes with low status (Chambers, 1983, 1989).



Source: Chambers (1983)

The United Nations Development Programme (UNDP) has developed an index that weighs many different criteria and aims to assess human security. According to its Human Development Report (1994), more than 2000 million people world-wide are defined as vulnerable. The report has indicated that the people especially affected include not only the estimated 49 million refugees and internally displaced, but also large parts of the population in countries where health care and social security systems have practically collapsed, where the role of NGOs, donors, private sector and local communities (beneficiaries) is crucial, or where economic policies have led to significant reductions in government spending in these sectors.

According to World Disaster Report, deaths reported from natural and technological disasters between 1984 and 1993 averaged 102,000 per year. This toll dropped by a third to average around 67,000 deaths per

year from 1994 to 2003. Over the same 20 years, the numbers of people reported affected by disasters climbed by 59 per cent from an average of 163 million per year (1984 -1993) to 258 million per year (1994 -2003). The report has indicated that the Flood disasters killed 16 per cent of the deadliest disasters of the decade 1994 -2004, with average of 70 to 80 lives per disaster (IFRC, 2004).

## **2.2 The Role of Private Sector in Developing Flood Risk Reduction Policies, Strategies and Plans:**

Development of guidelines and plans to reduce flood risk requires, on the one hand, support for the development of capacities to monitor the magnitude, duration, timing and location of flood hazards. On the other hand, it also requires promoting the assessment and reduction of the vulnerability to floods. This involves decision-making on issues such as development and planning control, legislation and land-use, environmental management and financial tools.

The development of policies, strategies and plans to combat flood risks should be based on a comprehensive strategy of flood risk assessment. This requires an integrated approach in which a wide range of mitigation measures should be considered. Within this overall process, full consideration needs to be given to the social, environmental and economic impacts of policy and program development (IFRC, 1995).

Planning for reduction of flood losses can involve government, at the local, provincial/state and national levels, NGOs, donors, private sector actors and local communities (beneficiaries). The national government develops strategies and policies that ensure a consistent framework wherever they are applied. This can extend to matters such as installation and maintenance of data networks, design standards for protective works, flood proofing standards, cost sharing arrangement, and incentive and insurance programs (IFRC, 2001).

The national level of government should take the lead in bringing the different stakeholders together, but should delegate the planning of the details and the delivery of the emergency response and preparedness program to the local level. The national and provincial/state governments will play a direct role in the operation of forecasting centers, and will supplement emergency response needs that exceed the capability of the local level. Higher levels of government are also expected to monitor the enforcement of policy measures by local levels.

Effective flood risk reduction will always involve a wide range of actors: different government agencies, NGOs, local communities, and the private sector. The private sector has traditionally played an important role in the post-disaster relief and recovery phase. However, better coordination among all the stakeholders at national and local levels is required to effectively channel the aid being provided, including that provided by the private sectors. Having a comprehensive disaster recovery and mitigation plan, which delineates the roles and responsibilities of all agencies including those in the private sectors during pre- and post-disaster situations, will facilitate greater cooperation and collaboration among them. Also, the formulation of disaster risk management plans must involve all actors, including the private sector. Ensuring adequate representation of the private sector in national, provincial and local level hazard risk management systems will be an important step in this direction.

Flood disaster's human and economic losses can be minimized by pre-disaster preparedness and mitigation actions. In many countries, the private sector contributes significantly to the creation of physical and industrial infrastructure. In association with relevant national agencies, efforts must be made to develop and establish improved techno-legal regimes for disaster-resilient infrastructure. Private sector actors can particularly contribute to building resilient economies, infrastructure and communities through the following disaster risk management activities:

- hazard and risk assessments
- awareness generation
- preparedness training and drills
- efficient logistics for rescue and relief operations
- provision of trained engineers, architects and building artisans
- development and application of cost-effective hazard-resistant technologies
- involvement in the development of all-hazard warning and monitoring systems
- development of risk transfer instruments

Participation from private sector companies in the relief and recovery operation during and following the latest flood disaster in Kassala (Gash) town in eastern Sudan in 2003, remained, overall, rather limited. Shell participated in the construction of a large number of houses for the flood victims in the Kassala area and AI Barbary Company for Transport provided the affected with tents and contributed to the construction of

camps and shelter provision. Although the contribution by local businesses was limited compared to their overall economical weight in the economy of Sudan, this participation reflects the potential as well as the willingness to contribute more significantly to risk reduction efforts were a joint strategy to be developed between SRCS, the Sudanese Government, and the local private sector.

The private sector has, in close collaboration with SRCS, the chance to play a key role, not only in Kassala but in the whole of Sudan, in guarding against future risk. By increasing investment, the private sector can develop alternative safety nets and create a diverse and resilient economy and society better suited to weather future disasters.

### **3. Sudanese Red Crescent Society Flood Disaster Risk Reduction Project and the private sector companies:-**

This part is mainly to introduce the Sudanese Red Crescent Society Flood Disaster Risk Reduction Project and the six companies selected as case studies to implement the idea of partnership between the Sudanese Red Crescent Society (SRCS) and the private sector in flood disaster risk reduction program.

The presentation of each one of these companies includes: Name of the company, . abbreviated name, date of foundation, general objectives, the main founders, the commodities produced, the Headquarters, the branches in the Capital and States, the organizational structure, the main events that the company has faced since its inauguration.

#### **3.1 Sudanese Red Crescent Society Flood Disaster Risk Reduction Project:**

The Sudanese Red Crescent Society (SRCS) was established in 1956. In response to the demands to alleviate the suffering and strengthening capacity of the vulnerable segments of the Sudanese population, through emergency relief and development programs, the SRCS has striven to fulfill its obligations and has been getting strong support from the people and its partners as well as from the Sudan Governments. This is in accordance with the Red Cross/Red Crescent Fundamental Principles and the Geneva Conventions.

SRCS is the largest humanitarian organization in Sudan, having a network of 21 branches all over the country, and over 700 units at provincial and district levels. It has a large volunteer network, with over 250,000 trained volunteers. According to its Strategic Work Plan 2000-2004, disaster preparedness (DP) is one of the core areas of the work of SRCS (Hayati, 2003).

Since 2001 SRCS has benefited from support through the DFID/IFRC Partnership Disaster Preparedness Program for East Africa. The pilot project focused on the development of a SRCS DP policy and plan, the establishment of an information network and capacity building in the flood-prone states of Khartoum and River Nile and the drought-affected states of Red Sea and North Kordufan.

In 2003 the ProVention Consortium decided to build on the DFID/IFRC Partnership and extend capacity building in disaster risk reduction to the community level. The main objective of the ProVention supported project is to reduce the risk in selected flood prone areas in Sudan through the introduction and development of effective flood preparedness and mitigation measures. Specific project objectives are:

- To improve the co-ordination and collaboration in the field of (flood) risk reduction and promote the development of partnerships between key stakeholders in Sudan.
- To strengthen the capacity of local organizations, such as SRCS, in disaster preparedness and micro-mitigation.
- To increase the awareness of local communities of the risks related to flooding and possible preparedness and mitigation measures to take.

National and state capacity building activities focused on the development of a DP training curriculum, the establishment of a country wide and regional working groups on floods and the organization of a national workshop on flood risk reduction involving all major stakeholders in the country. Community level activities were initially limited to Khartoum State and focused on awareness raising and micro-mitigation measures (September 2003 -March 2004). A second phase (April 2004 - December 2005) focuses on community based training on flood risk reduction, community risk mapping and the development of local risk reduction plans in three flood prone areas of the country: Khartoum State, River Nile State and Kassala State (SRCS,2004).

The key focus of the project is on the development and strengthening of partnerships in the field of disaster preparedness and mitigation. Partnership building involved SRCS, IFRC Sudan and Nairobi Regional Delegations, national and local government authorities, International NGOs, local civil society organizations (youth and women unions), academic institutions (Khartoum University) and the private sector.

Particular efforts are made in this project to actively involve local private sector actors who regularly face commercial losses from floods and are

concerned with the safety of their work force and the protection of their premises. The aim of this study is to determine ways to more effectively protect these businesses against the impact of floods through promoting a dialogue between these companies and civil society organizations active in flood risk reduction work, such as SRCS.

### **3.2 Coca Cola:**

DAL FOOD INDUSTRIES is a private company owned by five people and is the authorized bottler for the Coca cola Company in Sudan. It produces soft drinks such as coca cola and Fanta in addition to different juices. The Headquarters are located in Khartoum North-Industrial Area. It has branches in the capitals of all the states, such as Port Sudan, Medani, Kosti, Doungula, Atbara, and EI Obied. The company is managed by a Board composed of the General Manager, the Operation Manager, the Transport Manager, Engineers, Accountants and staff from the Personnel Department.

One of the merits of the company is that it has a market research unit concerned with market study and the analysis of the strengths and weakness of the company as well as the opportunities and risks which it may face. It has Quality Assurance departments in all branches which work in collaboration with the centre in Khartoum. The most important event in the history of this company is the success in obtaining the ISO 9001 :2000 Certificate. (<http://www.africa.coca-cola.com>).

### **3.3 Barbary for**

#### **Transport:**

Barbary for Transport is a private and pioneering company founded in 1906 by a group of individuals, the headquarters are located in Khartoum Industrial Area, and it has 21 branches in the states. Port Sudan branch is the most important one. The company works in the field of land transport. It is the sole and recognized agent for HYUNDAI Company in Sudan, and provides Saloon Autos such as ATOS, SONATA, and Mini-Bus-Van, H100 and Hino Trucks ZY and FB light trucks. It is also the sealed agent for Sudanese GLAD Autos. The company provides the after sale services through Maintenance and Parts Centre. Above all, the company is the only Agent for Han Book and Dunlop Tires, and Valvoline oil and Wax in Sudan. The company also imports building materials and electrical equipment especially from Samsung Company, as well as the majority of Sudan's requirements for printing paper.

The company possesses a big fleet of Hino Trucks for transport throughout Sudan, and is also an agent for sea shipping through Port Sudan for Export and Import purposes.

In addition to the specific objective of the company to realize high benefits and returns, there are other general objectives such as: to facilitate the transport of goods and to recruit big numbers of citizens as laborers and professionals (<http://elbarbary.com.sd/hsbweb>).

### **3.4**

**Mobitel:** The Sudanese Mobile Telephone Company (Mobitel) is the first company for mobile phones in Sudan and was founded in 1996. The aim of the company is to provide communication services, to achieve economic development and to bridge the isolated areas. It was founded by a group of foreign companies and the Sudanese government. The headquarters of the company are located in Khartoum Mogran; it has 74 branches in all states with more than five hundred Administrators excluding other employees. (<http://www.sdn-mobitel.com/web3/index.htm>).

### **3.5 Gum Arabic Company:**

The Gum Arabic Company LTD (GAC) is the most important company world wide in the field of Gum Arabic, founded in 1969 by the government in collaboration with the Producer Unions and some individuals. The aim of the company is to organize the Gum Arabic trade internally and externally, managing the gathering and preparation of the Gum Arabic and its export with high quality specifications. The main office is located in Khartoum with 13 branches and offices in Gum Arabic belt states.

The company is managed by a Board composed of the General Manager and four departments, sections and units. The most important events in the history of this company is beginning gum manufacturing in 1994 and the success in obtaining the ISO-9001/2000 Certificate.

### **3.6 Climax for Drugs:**

This is the one of the pioneer companies in the field of 'drugs in Sudan. It was founded in 1990 with the aim of producing different drugs types. The main office is located in Khartoum North (Kafoury- square 2). The company has no branches outside Khartoum North but its production reaches most areas of the country due to the effective distribution policy and better drugs quality. The company is owned by a number of individuals and managed by an organizational structure composed of professionals, pharmacists, technicians, operating engineers and laborers.

### **3.7 Shell:**

The Shell Company Sudan L TD is one of the most important and oldest companies working in the field of Petroleum derivatives. It was founded in 1928 in Sudan: 60% of the company belonged to the Dutch government and 40% to the British government. The main office in Khartoum is in Abu ELeia Building, and it has branches in all states of Sudan. The company is well represented throughout Africa and other parts of the world. It produces and markets all petroleum derivatives with good quality and proper safety measures. The company is managed by an integrated organizational structure.

### **4. Strengthening Community Flood Resilience:-**

#### **4.1 The Role of the Private Sector in Socioeconomic Development:**

To suit the scope of the study (provide an overview of existing contracts between SRCS and private companies in the humanitarian field) the survey investigated the following:

Table (1) Role of private companies in economic and social development:

Name of the company	The contribution in economic and social development		
	Job opportunities	Taxes payment	Social services support
Coca Cola	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Barbary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mobitel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gum Arabic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climax	<input type="checkbox"/>	<input type="checkbox"/>	X
Shell	<input type="checkbox"/>	<input type="checkbox"/>	X
Total	6	6	4

Source: Field survey- August 2005

The above table indicates the effective role of the private sector companies in economic development through provision of job opportunities, the payment of taxes and building of service institutions for the local community.

From the above table it is clear that as well as the contribution these companies make in creating job opportunities and paying taxes, one third of the companies have also contributed to the provision of services to the community over the last ten years. Many service institutions were

constructed by Coca Cola such as sport and culture premises and support was also provided to cover specific needs in the community. The Barbary Transport Company has contributed to the construction of a lecture Hall at the University of the Red Sea and maintenance of Port Sudan hospital. Mobitel did the same through its contribution in supporting many health and education institutions. The role of Gum Arabic Company in economic development is tangible through the Gum research centre and its contribution in building the Faculty of Medicine in West Kordufan University in addition to the digging of *Hafirs* and wells to provide clean drinking water in Gum Arabic belt states.

Table (2) Role of private companies in economic and social development:

Name of the company	The contribution in social development				
	Awareness raising	Student support	Marriage support	Funeral support	Others
Coca Cola	<input type="checkbox"/>	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>
Barbary	X	X	X	<input type="checkbox"/>	<input type="checkbox"/>
Mobitel	X	X	X	<input type="checkbox"/>	<input type="checkbox"/>
Gum Arabic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climax	<input type="checkbox"/>	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shell	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Total	4	3	3	6	6

Source: Field survey- August 2005

It is clear from the above table that the private sector companies support social development through a wide range of different initiatives. Generally the private sector companies support the community: 67% of the companies have awareness programs in the community including environmental sanitation, illiteracy, AIDS prevention, and bad habits prevention, this can be directly through raising awareness of staff of the companies which is known as Good Manufacturing Practice (GMP) or indirectly through supporting the institutions concerned with such programs in the community.

Three of the companies studied also support students. Coca Cola and Gum Arabic companies focus their support on helping Student Unions in different activities. Recently the Shell Company has begun supporting outstanding students from the Faculty of Engineering, University of Khartoum. The private sector companies support provided to students

reflects two main points: (i) the sincere desire to assist poor students, especially those who came from remote vulnerable areas (disaster prone areas), with housing, such as renting a house to be used as boarding house, and monthly financial support; (ii) the indirect student support is generally directed to Student's Groups, Societies, and Unions activities. This indirect support is provided through financial and material support to symposiums, workshops and cultural events. This support has been classified as an indirect support because private sector companies see these occasions as free publicity.

The Gum Arabic and Climax and Shell Companies are actively supporting the mass married financially, whether the couples were staff in these companies or not. Generally, each couple participating in such occasions will be provided with a lump sum of money which corresponds to three or four month's salary as well as two to three pieces of house furniture (beds, closets, cabinets, etc.). From the table the companies are also providing financial assistances to the staff in case of death, such as providing a lump sum of money or material support (sugar, food items, etc.) to be considered as a company contribution in funeral and condolences expenses. These kinds of support help to create a healthy and productive work environment by building- and enhancing the relationship between the companies and the staff.

It was also found that Mobitel and Barbary Transport companies support the handicapped through the provision of bicycles, as well as financial and material support to orphans. In addition to the above, the role of Coca Cola and Shell is obvious in supporting sport clubs and sport competitions. In 1999 Shell organized a football match between Hilal and Marielkh, the profits from which were allocated for the support of handicapped people. The Coca Cola Company has supported the Sudanese Champions League over the last ten years.

The role of the private sector companies in direct and indirect socioeconomic development in Sudan shows the obligation of these companies to the taxation system in Sudan and in the same time the social responsibility and religious obligation to Zakat Islamic System (1/40 out of the total of annual profits).

#### **4.2 Impact of Flood on Private Companies Activities:**

To suit the scope of this study (identify companies whose activities have been seriously affected by floods over the last ten years and documenting the direct and indirect damage), the survey investigated the following:

Table (3): Impact of floods on private companies

Name of the company	Impacts of floods	
	Direct	Indirect
Coca Cola	<input type="checkbox"/>	<input type="checkbox"/>
Barbary	<input type="checkbox"/>	<input type="checkbox"/>
Mobitel	<input type="checkbox"/>	<input type="checkbox"/>
Gum Arabic	<input type="checkbox"/>	<input type="checkbox"/>
Climax	<input type="checkbox"/>	<input type="checkbox"/>
Shell	<input type="checkbox"/>	<input type="checkbox"/>

Source: Field survey- August 2005

The above table indicates the direct and indirect impacts of flood disaster on private companies. With exception of Coca Cola and Mobitel Companies, all companies have been directly affected by floods disaster. The survey shows the direct and indirect impact of the floods disaster on private sector companies (table 4 -table 5).

Table (4): The direct Impact of floods on private companies over the last ten years

Name of the company	Direct Impact of floods			
	Building collapse	Damages	Delaying of work	Others
Coca Cola	X	X	X	X
Barbary	X	<input type="checkbox"/>	<input type="checkbox"/>	X
Mobitel	X	X	X	X
Gum Arabic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climax	X	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shell	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	X

Source: Field survey- August 2005

The above table shows the direct impacts of the floods on private sector companies in Sudan such as building collapse, damage to properties and delaying of work and so on. It was observed that Gum Arabic and Shell companies' buildings were severely affected by floods; many buildings of Shell Company in Kassala and Atbara had collapsed over the last few years, and the same has happened to buildings and stores of the Gum Arabic Company in the production zones. Another direct impact of floods is damage to raw materials and finished products by humidity.

Humidity related damage has caused large financial losses to the Gum Arabic, Climax, Shell and Barbary companies.

As far as delaying of work and low production is concerned, it was observed that all companies are affected with the exception of Coca Cola and Mobitel. It was found that work was delayed for some days and so consequently the production dropped in Barbary and Shell companies because of washing away and destruction of roads, particularly the Khartoum-Port Sudan road. The survey indicates the effect of floods on Gum Arabic and Climax where distribution and production of commodities lessened. Another direct impact of the floods includes the wetness of the raw and finished products as well as interruption of electricity supplies and electricity shortages.

Table (5): The indirect Impact of floods on private companies over the last ten years

Name of the company	indirect Impact of floods		
	Low consumption	Destruction of roads	Psychological factors
Coca Cola	<input type="checkbox"/>	<input type="checkbox"/>	X
Barbary	<input type="checkbox"/>	<input type="checkbox"/>	X
Mobitel	X	X	X
Gum Arabic	X	<input type="checkbox"/>	<input type="checkbox"/>
Climax	<input type="checkbox"/>	<input type="checkbox"/>	X
Shell	<input type="checkbox"/>	<input type="checkbox"/>	X

Source: Field survey- August 2005

The above table illustrates that all companies are affected by one or more of the indirect impacts of floods which include low consumption, destruction of roads and the psychological factor on consumers and producers due to affected surroundings and the situation of the victims.

It was found that as a result of a disaster two thirds of the companies were affected by a drop in consumption. Demand for Coca Cola, Shell and Climax products dropped and the Barbary transport company found that there was a drop in demand for the transport of goods.

The impact of road damage is clear and around 85% of the companies surveyed (Coca Cola, Barbary, Gum Arabic, Climax, and Shell) were affected.

The psychological impact is low compared to the indirect impacts and only two companies, Coca Cola and Climax, were affected. Hence, the degree of vulnerability to the impact of flood differs from one company to another (see table 6).

Table (6): The degree of flood hazard on private companies:

Name of the company	Degree of hazard		
	High	Moderate	Low
Coca Cola	X	<input type="checkbox"/>	X
Barbary	X	X	<input type="checkbox"/>
Mobitel	X	X	<input type="checkbox"/>
Gum Arabic	<input type="checkbox"/>	X	X
Climax	X	<input type="checkbox"/>	X
Shell	X	<input type="checkbox"/>	X

Source: Field survey- August 2005

The above table indicates that the degree of the identified flood hazard differs from one company to another: flooding is considered as an acute hazard for Gum Arabic Company due to the vulnerability of production zones, whereas floods are considered as a moderate hazard for Coca Cola, Climax and Shell. Barbary and Mobitel Companies considered flood as a low hazard.

#### 4.3 The Role of Private Companies in Flood Disaster Mitigation:

In order to assess the role of private companies in flood disaster mitigation the survey investigated the following:

Table (7): The role of the private companies in flood disaster mitigation:

Name of the company	Role			
	Construction	Building terraces	Training	Early System Warning
Coca Cola	X	<input type="checkbox"/>	X	X
Barbary	<input type="checkbox"/>	X	X	X
Mobitel	X	X	X	X
Gum Arabic	<input type="checkbox"/>	<input type="checkbox"/>	X	X
Climax	<input type="checkbox"/>	<input type="checkbox"/>	X	X
Shell	X	X	<input type="checkbox"/>	X

Source: Field survey- August 2005

As can be seen in the table above, the floods disaster preparedness of the companies surveyed is very weak particularly in the fields of training and Early Warning System (EWS). It was found that three companies

(Barbary, Climax, and Gum Arabic) implement disaster mitigation measures by reinforcing their premises. On the other hand, the other three companies (Coca Cola, Gum Arabic and Shell) built terraces. Shell is the only company concerned with training and more emphasis is placed on fire fighting. None of the companies surveyed had an early warning system despite the fact that this is considered the basis for disaster preparedness and mitigation. The absence of EWS in the private company's activities increases the degree of floods hazard on them.

Table (8): The contribution and cooperation of the private companies with local communities in flood relief and rehabilitation :

<b>Name of the company</b>	<b>The role of the company</b>		
	<b>Relief</b>	<b>Rehabilitation</b>	<b>Shelter provision</b>
Coca Cola	<input type="checkbox"/>	X	X
Barbary	<input type="checkbox"/>	X	<input type="checkbox"/>
Mobitel	<input type="checkbox"/>	X	X
Gum Arabic	<input type="checkbox"/>	X	X
Climax	X	X	X
Shell	X	<input type="checkbox"/>	X

Source: Field survey- August 2005

The above table reveals the low contribution of the private companies in flood relief and rehabilitation at the community level. The majority of the private companies (67%) participate directly in providing emergency assistance to the affected people or indirectly by supporting humanitarian organizations and agencies.

The role of the private companies in rehabilitation is nil with the exception of Shell which participated in the construction of many buildings in the Kassala area. Regarding the provision of shelter to the affected people the only company concerned is Barbary in East Sudan through the provision of tents, construction of camps and accommodation of flood disaster victims.

In this context, it is necessary to identify the role of the government in flood disaster mitigation so as to reduce the losses to the private companies. In order to investigate the above issue, the perception of the private companies Actors was investigated (see table 9).

Table (9): Perception of the Private Companies Actors about the Role of the Government in Flood Disaster Mitigation:

Name of the company	The role of the government (perception)			
	V. Weak	Weak	Strong	V. Strong
Coca Cola	<input type="checkbox"/>		X	X
Barbary	<input type="checkbox"/>		X	X
Mobitel	X	<input type="checkbox"/>	X	X
Gum Arabic	<input type="checkbox"/>		X	X
Climax	<input type="checkbox"/>		X	X
Shell	<input type="checkbox"/>		X	X

Source: Field survey- August 2005

The majority of companies (85%) perceive the government as having either a weak role (Mobitel) or a very weak role in flood risk reduction and mitigation. Most of the companies surveyed said that they had the impression that the government only responded after the disaster had occurred.

#### 4.4 The Cooperation between private companies and SRCS:

To achieve the scope of the study (to study the interests of the private companies in increasing cooperation with SRCS Flood Disaster Risk Reduction Program...) the survey investigated the following:

Table (10): The cooperation between SRCS and private companies in flood disaster reduction:

Company name	No cooperation	Weak cooperation	Strong cooperation
Coca Cola	X	<input type="checkbox"/>	X
Barbary	<input type="checkbox"/>	X	X
Mobitel	<input type="checkbox"/>	X	X
Gum Arabic	<input type="checkbox"/>	X	X
Climax	<input type="checkbox"/>	X	X
Shell	X	<input type="checkbox"/>	X

Source: Field survey- August 2005

The above table (10) indicates no cooperation between Barbary, Mobitel, Gum Arabic and Climax companies with the SRCS in flood disaster prevention, whereas there is weak cooperation between Coca Cola and Shell companies with SRCS in first aid training only.

The study observed weak cooperation, lack of initiation and seriousness, and loose coordination in disaster prevention projects between the private companies and civil community organizations including SRCS. Fortunately, it was found that the private companies were prepared to work towards developing strong cooperation with SRCS in flood disaster prevention as well as other humanitarian fields in the future.

#### **4.5 Suggestions to Develop a Joint Strategy between SRCS and Private Companies for Flood Disaster Prevention:**

To achieve the scope of the study (propose elements for a joint strategy between SRCS and private companies...) the survey reveals the following result for each company in turn (table 11).

Table (11): Proposed elements for a joint strategy between SRCS and Private Companies:

Company name	Strategy	Partnership Type (finance and technical support)	Commitment Conditions	Time frame
Coca Cola	Continuous training of Workers Training of community segments prone to the disaster	Partial	Preparation of training avenue Financial support	2006
Barbary Transport	Accommodation of affected people	Open whenever the disaster occur	To work in East of Sudan. Provision of transport and part of financial cost.	Open
Mobitel	Establishment of Early Warning System	Shared (50%)	Provision of finical support. SRCS to provide Qualified	Open

			Cadres.	
Gum Arabic	Construction of <i>Hafirs</i> . Construction of health facilities in prone areas.	Shared (50%)	Financial support. SRCS to carry out awareness program and provide Qualified Cadres.	2006
Climax for Drugs	Provision of drugs for flood disaster associated diseases. Training	Shared (50%)	The company provide avenue and transport facilities. SRCS to provide Trainers	As soon as possible
Shell	Training	Full care (100%)	Establishment of coordination body Development of plan Provision of Qualified Cadres	2006

Source: Field Survey – August 2005

### **5. Conclusion:-**

The study finds that Coca Cola, Barbary, Gum Arabic, Climax and Shell companies are examples of private companies whose activities have been seriously affected by flood disasters over the last ten years.

These companies play a positive role in economic development and in the humanitarian fields through their contribution in the provision of job opportunities, payment of taxes, construction of public service institutions, raising community awareness, support for outstanding students, supporting of marriages and death occasions, and the welfare of specific groups and handicapped people in the community.

These companies are directly or indirectly exposed to the flood hazards that threaten and hamper their contribution in social and economic development as well as in the humanitarian activities. The threat of flood hazard on these companies comprised: collapse of buildings, damage of raw and finished products and commodities, delaying of work, destruction of roads, fall in production and consumption of commodities. Over the last ten years, it was found that when a disaster occurred 68% of the selected companies contributed through the compensation of affected people, 16% contributed in the rehabilitation of houses and 16% of them provided accommodation for the disaster affected population.

The study findings reveal the low contribution of the government in flood disaster prevention, as well as the lack of coordination between the selected companies and the SRCS in the same field. However, all selected companies assured their future cooperation with SRCS in flood disaster prevention activities against clearly developed partnership strategy.

Present and future positive cooperation and local partnership between all selected companies, SRCS, and local societies in flood disaster risk reduction will assist the vulnerable societies to flood disasters to use strategies that enhance self-reliance so as to protect the victims of disasters from developing a dependency syndrome and will rely on building local capabilities and coping mechanisms.

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