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## **The Effect of Kenena Sugar Company on Community Livelihood: A case of Altogaba Village, White Nile State, Sudan**

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### **ABSTRACT**

The purpose of the study was to investigate the influence of Kenena Sugar Company (KSC) as a large scale development project on rural communities of the White Nile State. The study was conducted in Altogaba village to examine the influence of the company on their livelihoods assets.

The study objective is to find out the changing pattern of livelihoods due to establishment of the KSC. Specifically, the study sought to answer the following questions-

1. How did the intervention of the company affect the community's physical assets?
2. How did the intervention of the company affect the community's natural assets?
3. How did the intervention of the company affect the community's human assets?
4. How did the intervention of the company affect the community's social assets?

Primary data was collected using a questionnaire designed to cover all study aspects in open and closed-ended questions filled in face to face interview session. In addition, secondary data was obtained from relevant sources, including books, journals, websites and Kenena' reports. 45 households participated in the study. The quantitative method was the primary method and analysis of the data was done using SPSS version.

The main findings of the study showed that, there were changes in principal economic asset .Most of households (66.7%) engaged in multipurpose activities, waged labour (permanent& outsource labour) in the company's farm/ factory. Also differential development change happened in physical assets (most households have an access to health care services, and education), in natural assets, more than half (53.3%) of households overhead tank became as main source of water. You mean safe water supply Negative change happened in the livestock ownership, most households got rid of their animals in compliance with company rules and regulations.

The study draws some policy and research recommendations from the main findings. KSC should facilitate and invest in provision of diversified livelihood activities to increase community resilience through expansion of their financial capital base thus reducing their vulnerabilities.

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### **INTRODUCTION**

The important livelihood pattern in White Nile is cultivated crops, and rearing different types of livestock. The State accommodates about 6% of Sudan's livestock wealth and ranks fourth in the total livestock numbers and livestock density (7.1 TLU/ km<sup>2</sup>) among the 15 Northern states. (WFP 2007). Agriculture is the main livelihood activity in the state and 65 percent of the state population work either as farmers or as seasonal labourers and the animals that were raised were mainly cattle, sheep, and goats, with very few camels. (FAO, 2011). Kenena Sugar Company (KSC) is one of the biggest development projects located in the White Nile state with the main aim to improve the livelihood of rural communities in White Nile state.

This study attempts to identify the effect of company interventions on community livelihood in four aspects (which are: physical, natural, human and social,) in Altogaba village.

### **SPECIFIC OBJECTIVE**

1. To find out the changing pattern of livelihoods due to establishment of the KSC in term of :
  - Physical asset

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- Natural asset
- Human asset
- Social asset

## **METHODS**

### **Study Area**

Study focused on Altogaba village because it is directly affected by policies and activities of Kenana Sugar company. Altogaba is located about five kilometers in the southern side of Kenana Sugar Company, with total population of 15,316 persons living in 380 households. The main pattern of farming in this area is rain-fed agriculture. People also rear some animals such as cattle and small ruminants, as well as working as labourers in Kenana Sugar Company. In this village 380 families, living in six distinct clusters, these clusters for the most part were tribally based.

Multi-stages sampling was used to select households from the village as follow:

**Stage1:** The six clusters (tribe residence) were given numbers 1-6 according to the name of the tribe.

**Stage2:** needs clarification once the clustering process was ready, study using random sampling technique. In selecting the respondents, assistance from the community leader in the village was also used, with age as a variable taken into consideration.

**Stage3:** Snow ball sampling was used to select all other households in each cluster in the village, its 45 households (38 male&7female). Snowball sampling is a method typically used with unknown or rare populations or have not all been previously identified and are more difficult to locate or contact than known populations. The SPSS package was used to analyze data.

## **RESULTS AND DISCUSSION:**

### **Source and Income of Livelihoods of Household**

There is a significant change in the source of livelihoods or occupational pattern, as a major corporation, Kenana recognizes its social responsibility towards directly involving workers within the complex and the community in the neighborhood. Ever-since its establishment, a part and parcel of Kenana’s operation budget was directed to this aspect. This is reflected in the social services provided to a number of villages within Kenena complex and the vicinity.

**Table1.**

<b>Type of occupation of households</b>		
Type of work	Frequency	%
Working as waged labour in company’s farm	30	66.7
Small scale business	8	17.8
Unemployed	5	11.2
Housewife	2	4.4
Total	45	100

**Source.** Field survey2012

In the study area, most of the household head’s principle occupation had been agriculture until 1975 as mentioned before, however, change has occurred to some extent after the establishment of the sugar factory as 66.7% of the households, heads changed their ? occupation, they got more engaged in multipurpose activities such as, waged labour (permanent& outsource labour) in the company’s farm, factory. While 17.8% of the household, worked in small scale business outside the farming area. All surveyed households in addition to their jobs were still practicing rain-fed farming in the marginal lands around the company farms.

**Table2.**

<b>Total Income of households</b>		
Income /sacks/ pound	Frequency	%
11-20sacks	14	31.1
1000-1500SDG	5	11.1
More than 1500SDG	19	42.2
There no income	7	15.6
Total	45	100

**Source:** Field survey2012

42.2% of households earned monthly income of more than 1500SDG and 11.1% earned 1000-1500SDG. This indicates that, the major income was from off-farm activities. This conformed the idea that there is a big change that took place in the livelihood patterns as a result of Kenena. (Compare with the past income)

Still 31.1 percent were dependent on farming as the main source of livelihood. However, their farm yields decreased ranging from 11-20 sacks per year and this can be attributed to loss of their land to the company. This supported by *FAO and Ministry of Agriculture, 2011*.

“Since agriculture generally remains the major activity of household heads, it deserves greatest attention for livelihood improvement. Nevertheless, promotion of wage and skilled-labor jobs will be justified on account of their contribution to a diversified mode of livelihood. These are of particular importance in Tandalti, Kosti, Alsalam and Algabalain localities”.

## PHYSICAL CAPITAL

### Household Properties

**Table3.**

Material that used of residence N=45		
Material	Frequency	%
Mud	30	66.7
cement	2	4.4
Mud+ bricks	13	28.9
Total	45	100

**Source:** Field survey2012

66.7% of households their houses built from mud, while 28.9 % were built from mud and cement with public electricity and water facility. This meant that there was significant changes that happened after company intervention, first, at livelihood patterns, households were change from agro-pastoralist into permanent settled, second, change in material of building. This indicated that there was improvement in the economic status and standard of living. This was supported by (*Ellis, 2000*).

“Literature on poverty often assumes that rural households have a preference for cement brick houses and that housing styles are an indication of socio-economic status.”

**Table4.**

Types of households properties N=45		
Type	Frequency	%
radio	8	17.8
T.V	1	2.2
fan	1	2.2
bicycle	1	2.2
mobile	4	8.9
Radio +mobile	6	13.3
don't have	3	6.7
radio+ T.V+ mobile+ car	3	6.7
radio+ T.V +mobile + refrigerator +fan	18	40.0
Total	45	100

**Source:** Field survey2012

Change also happened in household appliances where, 82.2% of the households owned different kinds of appliances like mobile, TV, fan, refrigerator in addition to radio. This indicated that improvement was happened in standard of living due to changes that happened in their source of livelihood.

### Livestock Production System

**Table5.**

Number of households' animal N=45			
Type	Minimum	Maximum	Mean
	0	0	0
Camel	0	5	0.62

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Cattle	0	200	8.09
Sheep	0	150	5.98
Goat	0	20	1.40
Poultry	0	20	1.40
Donkey	0	1	.16

**Source:** Field survey 2012

A big change happened in the livestock ownership after the company intervention, most people got rid of their animal ( *See table above* ) in compliance with company rules and regulations ( people are not allow to rear any kind of animals after the company started to grow sugar cane).

There is clear evidence that the communities in Altogaba village were left with very limited livelihood options in the company area as most of them indicated to have little or no significant secondary income sources. Increased exposure to landless and no animal will exacerbate their vulnerabilities by compromising their household food security. This agrees with *Morris, 2008*,

*“Vulnerability refers to insecurity of well-being of individuals, households or communities in the face of a changing environment. Environmental changes that threaten welfare may be ecological, economic, social or political. Risk and uncertainty and declining self respect tend to accompany environmental changes” (Morris, 2008).*

### **ECONOMIC STATUS AFTER INTERVENTION:**

The research revealed that the first most important livelihood sources for the assessed households before intervention were crop production followed by rearing of livestock and small trading. After intervention those sources changed as mentioned above. Those changes resulting from, company claimed on their farmlands also on their livestock as their concessions. For that claim, company compensated households by some money as the value of land and one of the economic gains, the other source of economic gain is that, the company offered some kinds of jobs (permanent, daily waged labour) in farm or factory.

The effect of that economic gain, households reported that, some of them have not received any type of compensations from company other than receiving but money. However, the money received did not match the value of their land. This implied that, farmers had lost financial returns or money as a result of these changes and the main economic classification depend mainly on salary from their work in company or small business.

Prior to 2007, they claim that they had direct relationship with Kenana, but this has now changed and the responsibility has been transferred to a new labour contracting company. These labours consider that they are being paid less, plus poor meals. The process of selection itself is not without biases, they claim, even if from area far from Kenana; also non- Sudanese laborers were employed and the local labours had to accept unfavorable work conditions; this is what they claim.

### **INFRASTRUCTURE AND COMMUNICATION**

There were changes in infrastructure and communication in the study area. There is main road was constructed by company which connect study area with Rabak city, other semi- constructed road was established inside the village by company also as one of commitment to the community. In addition to other unconstructed roads in- side area. This meant that, village became well planned, settled and connected with the main cities. These connections lead to change in the livelihood pattern of the households such as (food habit, type of clothes, etc). This agrees with *Ellis, 2000*

*“Physical capital assets consist of capital that is created by the economic production processes”*

**Table6.**

<b>Source information</b>		
<b>Source</b>	<b>Frequency</b>	<b>%</b>
Elshiekh	7	15.6
Community members	13	28.9
Company	2	4.4
local committee	23	51.1
<b>Total</b>	<b>45</b>	<b>100</b>

**Source:** Field survey2012

Regarding source of information and roads, 84.4% of households agreed that there was change that occurred in the source of information; where there were different sources including: community members, local committees, company, and people outside community) rather than one source. This meant that, well road communication has widened the scope for the villagers to go out in search of livelihoods for knowledge about livelihoods.

**Table7**

Access to get information and news		
Access	Frequency	%
full access and satisfaction	30	66.7
partial access	13	28.9
no-access and satisfaction	2	4.4
Total	45	100

**Source:** Field survey2012

66.7% of head of households agreed that they have full access and full satisfaction with reliability of information rather than before company’s intervention.

These results indicated that, there is positive change in the study area and the physical capital where roads and means of transportation are essential to diffuse knowledge and technology, which facilitate the development of communities, also the construction and development of roads and communication networks enhances the proper and fast marketing of farm produce and also the movement of rural people for other activities, even off-farm activities. Development of physical capital can enhance the effectiveness and efficiency of sustainable livelihood outcomes .This agrees with *Robert Chapman ad et al, 2005*

“Communication can help in access to markets and market information helps to improve choices for the sale of goods on local markets according to enhanced information on prices and comparative supply and demand for products. In the longer term new markets, techniques and processes for production, processing and marketing of products; both farm and nonfarm can be explored”.

## EDUCATION SERVICES

**Table8**

Status of schools N=45										
Status	Very good		Good		Suitable		Weak		Total	%
	Frequency	%	Frequency	%	Frequency	%	Frequency	%		
Building	19	42.2	17	37.8	6	13.3	3	6.7	45	100
Seating	12	26.7	3	6.7	20	44.4	10	22.2	45	100
Availability Books	7	15.6	19	42.2	11	24.4	8	17.8	45	100
Availability Teachers	9	20.0	20	44.4	8	17.8	8	17.8	45	100

**Source:** Field survey2012

All surveyed households reported that, after settlement, the company built two kindergartens, three primary schools and two secondary schools. Also other two primary schools and one secondary school were built by cooperation between government and community.

According to the status of these schools, 42.2% of household seen the availability of text books its well, always it was arrived on time, but after 2007 sometimes did not arrived in time plus there was reduction in the quantity of books. Other group of households 42.2% seen between suitable and weak, while 15.6% of households said that, availability of text books was very good.

Half of households 44.4% agreed that the status of school’s sitting was suitable, 26.7% of households were saw it was very good status and the rest described it as weak status.

44.4% of household reported, availability of school’s teachers was good, and 20% saw it as very good but the rest 17.8% suitable, and 17.8% weak. This meant that residents at village level were likely to be better positioned to take up any new skilled or semi-skilled employment opportunities that could arise as a result of development activities. How about perception of the teachers.

**Health Services**

**Table9**

<b>Status of health center N=45</b>										
Status	Very good		Good		Suitable		Weak		Total	%
	Frequency	%	Frequency	%	Frequency	%	Frequency	%		
Building	19	42.3	20	44.4	6	13.3	0	0	45	100
Availability of medical team	9	20.0	8	17.8	8	17.8	20	44.4	45	100

**Source:** Field survey2012

Communities became settled after company intervention. Resulting for that settlement, at the beginning company was established new health center as commitment to those people after that center develops and became small rural hospital. Most of households 85.4% reported that the rural hospital was very good status regarding to size and place, while 13.3% were think its suitable status.

44.4% of households agreed availability of medical team in hospital is available but not all the day, if they are available they were no good qualify team, also lack of some facilities like shelter (medical assistant is from outside area) which lead to long distance problem. DRUGS AND OTHERSERVICES

**NATURAL CAPITAL**

**Land**

**Table10**

Types of land access		
Access	Frequency	%
Full access	0	0
Partial access	16	35.6
No access	29	64.4
Total	45	100

**Source:** Field survey2012

As mentioned above, all households had fully access and rights to their land (agriculture, grazing and residential) before intervention. According to verbal condition that set by company with land owners, was to leave their land and moved into south | (new area). So that residential land was relocated into another land, grazing and agriculture land was influenced directly or indirectly by land use changes. 64.4% have no access to their land, while 34.6%.their right of land was change from full access into partial access.

**Water**

**Table11**

<b>Source of Water</b>		
Source of water	Frequency	%
private tap	24	53.3
river Nile	6	13.3
Khor	2	4.4
Over –head tanker+ Kenena canal	1	2.2
Total	45	100

**Source:** Field survey2012

There is a significant change in the source of water after the intervention. More than half (53.3%) of household their main source was village overhead tank which was sponsored by company to supply village with clean water. local government which connected houses by private pipe-grid from (the cost of project was partnership between the company and the local government) Some 26.7% of the community were dependent on water tanker (provided by the company) plus the irrigation canal, because they were not connected due to economic reasons (connection fees) , and the other 13.3% were dependent on the White Nile and Khor ( natural trenches that drain the rain water) because the water services did not reach to their residential area ,this area is considered as an extension area to old village, it contained part of the native tribe plus some immigrants. (Three tribes dwelled after the interventions of Kenena Company, these tribes are, *Sabaha, ElHassanya, and Sebah*).

**Table12**

<b>Consumption of water</b>		
Consumption	Frequency	%
Half –barrel	8	17.8
Barrel	10	22.2
more than one barrel	27	60
<b>Total</b>	<b>45</b>	<b>100</b>

**Source:** Field survey2012

According to the accessibility and consumption of water, most of household, reported that, before 2007 there was a full access to source of water, water is available all day in their home or through tanker services.

60% of them were consuming more than one barrel, while 22.2% of them spent one barrel. From this result, there was observed increasing in the consumption of the water, this indicated that, there is some change was happened in the livelihood pattern such as type of residence need more water for cleaning plus watering some plant inside or outside their home.

After 2007, there was reduction in the quantities and qualities of water that comes from company’s container, that regarding to company policies (later it handed over the responsibility of water supply to the local government) in addition to expansion of village regarding to the immigrants. According to the qualities, water, “sometimes” it flows without any chemical treatment, with the main source of water being the surplus of cane irrigation process, carrying with it all the remains of the fertilizers and insecticides applied, this meant that water pollution one of the environmental problem resulting from company.

This indicated that, all head of household who are facing serious water scarcity right now are mostly deteriorating their living condition and hindering their livelihood operation. Access to water plays a key role in development; it sustains human life, both through direct consumption and use in agriculture (for food security) and industrial activities. While water availability for drinking proposes is essential, it cannot be separated from wider water resource management issues, also increased access to safe drinking water results in improved health outcomes in the form of reduced cases of water-borne diseases.

## **Environment**

**Table13**

<b>Nature of environment</b>		
Nature	Frequency	%
semi-contaminated	12	26.7
Contaminated	33	73.3
<b>Total</b>	<b>45</b>	<b>100</b>

**Source:** Field survey2012

73.3% of household agreed that there was big change in their environment as it became very contaminated with different types of pollution, such as sewage and waste system, sugar bio-products bagaz, smoke, ethanol (Venasse) and fires of sugar cane burning. This goes with environment journal 2010,

*“Environmental pollution is the introduction of harmful pollutants into a certain environment that makes an environment unhealthy to live in. The widespread pollutants are usually chemicals, garbage, and wastewater. Environmental pollution is happening in multifold parts of Earth usually in the form of air and water pollution”.*

Therefore natural capital is the core and principal foundation for the building of rural livelihoods and its full utilization results in sustainable outcomes if brought under human control. The above data says that both of these natural resources are in a vulnerable position in Altogaba village.

## **HUMAN CAPITAL**

### **Education and Training**

There is significant change in educational level after intervention, this goes with Kenena CSR report 2011 which states that education is the most important human capital in terms of livelihood operation such as acquiring new skills. This goes with Craig (1967),

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“Education and Training defined as an organized and coordinated development of knowledge skills and attitudes needed by an individual to master a given situation or perform a certain task within an organizational setting”.

The Educational system in Sudan had undergone considerable changes. Before 1970 it was a system comprised of 4 years of primary, 4 years intermediate and 4 years of secondary education. Between 1970 and 1991 the system comprised of 6 years of elementary education 3years of junior secondary and 3 years of high secondary education. In 1991 the system was changed to 8 years of basic education and 3 years of secondary education. This has caused difficulties in the recording of information on the level and grade completed.

**Health**

**Table14**

Type of diseases		
Type	Frequency	%
Malaria	2	4.4
Bilharzias	3	6.7
Respiratory disease	12	26.7
Eye disease	15	33.3
Typhoid	8	17.8
All of the above	5	11.1
Total	45	100

**Source:** Field survey2012

All households reported that, there was a new disease diffused in the community as result of company and farm bio-product like ash which caused different type of respiratory and eye diseases. This was clear in the section environment above.

This agrees with *Resurrccion,B,E & etal, 2008.*, Environmental pollution is any discharge of material or energy into water, land, or air that causes or may cause acute (short-term) or chronic (long-term) detriment to the Earth's ecological balance or that lowers the quality of life. Sugar factories is one of pollution source, such as, the bagasse, on burning, produces particulates, viz., unburnt fibers, carbon particles and gaseous pollutants like oxides of nitrogen, water vapour and other organic compounds. Of the particulate waste, the heavier particles slowly settle down in the surrounding area. Such dust fall leads to the problems of cleaning, reduction in property value, effect on vegetation, etc.

**SOCIAL CAPITAL**

**Social Networks for Community’s Problems**

**Table15**

Social net work for community problems		
Response	Frequency	%
Totally agreeing	15	33.3
Not totally agreeing	13	28.9
Not totally disagreeing	11	24.4
Totally disagreeing	6	13.3
Total	45	100

**Source:** Field survey2012

The degree of social network had slightly decline when compare with the period before intervention of company, 37.7% of the household said that, this refers to different causes, one of the major causes was the change that happened to the social structure, system attitude and to the source of livelihood.

**Social Network for Personal Problems**

**Table16**

Social net work for personal problems		
Response	Frequency	%
Totally agreeing	19	42.2
Not totally agreeing	12	26.7
Not totally disagreeing	5	11.1
Totally disagreeing	9	20.0
Total	45	100

**Source:** Field survey2012

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The emergence of new livelihoods in the village has attracted the labourers from other neighboring area to settle in the area. That referred to provision of social services, work, and permanent residence. All these led to extension in area, introduced of new tribes and competition in services and work.

There was clear difference in the social network and interaction towards personal problems; this difference indicated that, there was a change in the lifestyle and in economic source which lead to decline in community cooperation toward personal problem. This finding was in line with *Muruviwa Addmoret 2011*

“In developing countries, social networks seem to be predominant as evidenced by rural people who help each other in times of distress, and by family ties that keep people together and unify them. However the modernization of rural area has affected family ties, as migration has taken its toll in disintegrating families also affected on community member also” *Muruviwa Addmoret, 2011.*

**Social Network for Direct Benefit from Development Project**

**Table17**

<b>Social network for direct benefit from development project</b>		
<b>Response</b>	Frequency	%
Totally agreeing	40	88.9
Not totally agreeing	3	6.7
Not totally disagreeing	1	2.2
Totally disagreeing	1	2.2
<b>Total</b>	<b>45</b>	<b>100</b>

**Source:** *Field survey2012.*

From table above, there was noticeable increase in the attitude of community member toward participation in development activities. This result have pointed out that, natural, physical, human and social capital were productive resources facilitating social networks between individuals, institutions and organizations in livelihood building. Associations in which people participated were to be very important as they provide that contributes to their livelihoods. This was supported by *Putnam et al (1993)* “Social capital is the idea that it facilitates coordination and cooperation for the mutual benefit of the members of the association”. *Putnam et al (1993).*

**Social Network for Indirect Benefiting from Development Project**

**Table18**

<b>Social network for indirect benefit from development project</b>		
<b>Response</b>	Frequency	%
Totally agreeing	12	26.7
Not totally agreeing	16	35.6
Not totally disagreeing	7	15.6
Totally disagreeing	10	22.2
<b>Total</b>	<b>45</b>	<b>100</b>

**Source:** *Field survey2012*

Regarding participation of community member in development project but that have no directed benefit for them, 62.3% of head of households totally agreeing and not totally agreeing that social capital was, therefore, probably strongest at the level of the neighbourhood, as it was at this level that most forms of cooperative organization, including decisions regarding land use take place. This meant that change happened in the attitudes of people towards participation in development activities had no direct impact; this may be attributed to change in the livelihoods pattern where people became settled and secure with their resource. This agrees with, Putnam, 1993,

“Social capital theory assumes that building social networks, trust, and cohesion lead to active participation in local services and voluntary associations; individuals thereby identify and support collective goals that reinforce norms of reciprocity and a more connected and caring community. Social capital can also facilitate collective actions that encourage local political participation” (*Putnam, 1993*).

## **CONCLUSIONS AND RECOMMENDATIONS:**

### **Conclusions**

It is found that, before company intervention, the livelihood pattern was very simple, people moving from place to another in an unsettled fashion. Due to that, they owned very simple households appliance (Radio), and they had no access to social services and owned land with different size.

It can be said that, the company intervention has had positive and negative effects on the livelihood of households in Altogaba village with differential degrees; for example, the economic situation of the villages strongly improved due to intervention. Moreover, most households became professional in mechanized agriculture (sugar cane) and new sources for generating income were increased.

Moreover, it is found that education and health status in the study area has been strongly improved, as whole generation of children has been enrolled in different schools and the rate of educated people has become high.

It was also found that the company intervention has had an effect on social capital in study area; before intervention, people did not participate in any development activities due to the type of livelihood. After intervention, community participation in development activities was increased.

It can be concluded that KSF/C part of CSR policies planned, distributed new residential area at village, and building, rehabilitation of schools and health centers.

Finally it can be concluded that people in village developed some coping mechanism such as: livestock owners selling their animals and others heading towards seeking new grazing lands or making agreements with households who still have land outside the area to rent part of their land for grazing of cultivation of crops to households who lose their land as a coping strategies to overcome the negative impact of the KSF/C intervention.

### **Recommendations**

#### ***Policy Implications***

Based on the findings of this study the researcher has drawn the following recommendations:

- KSC should facilitate and consider development of the human capital through provision of training to build the capacity of community members and upgrade their skills competence on finding job opportunities.
- KCS should enhance and improve recycling of factory's waste and raise people's awareness towards the health and environmental impact resulted from the operations undergone at the company's farm and factory.

### **REMARKS**

1. Too many tables. You can combine some tables in one like , one table for services
2. Very few references
3. Writing a paper is different from writing a thesis.
4. Read carefully the guidelines given by the journal selected for publication
5. Avoid repetition.

It is a publishable paper after improvements

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