Open incubators and clusters in South Sudan: A move to achieve economic peace

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The objective of this research is to generate a process of economic development able to overcome conflicts between populations in the different states of South Sudan by creating common economic interests. Within the framework of the World Bank Capacity Building program, we had the opportunity to lead two parallel focus groups in South Sudan, one on economic strategy and the second on public policy and regional decentralization. In order to achieve the objective of our research, we used the Porter's Diamond and the clustering process at the national level and the open incubator model at the regional level. The participants identified three potential clusters which involve all the states and are able to create common economic interests between populations: forest related products, gum arabic and its applications, palm and sesame oil. The clustering process could start by open incubators. Other Open incubators specialized in vegetables, crops and cattle will supply the basic needs in the different states and strengthen the decentralization process generated by the three selected clusters. The open incubators solve the problem of current life and insure the subsistence of the population. The three clusters prepare the second phase of development, the industrialization process based on competitive advantages generated by more efficient use of local resources. We involved the different populations in solving conflicts by improving economic added value for subsistence and for a better future.

Key words: Clusters, decentralization, South Sudan, competitive advantage, tipping point.

INTRODUCTION

Interdependence between education, labor, telecommunication, energy, agricultural, industrial, and economic policies requires cooperation in order to achieve economic development and regional decentralization. Top directors and administrators in the different ministries, in charge of the economic and social development have to meet together and plan common actions in order to generate new competitive advantages. Within the framework of the World Bank Capacity Building program, in cooperation with the Galilee International Management Institute (GIMI), we had the opportunity to lead two parallel focus groups in South Sudan one for representative of different ministries on economic strategy and the second for public organizations on regional decentralization. The capacity building programs of the World Bank in developing countries provide managerial and creative knowledge to those in charge of leading changes in economic and social policy. The
participants discussed which process of economic development will be able to overcome conflicts between populations in the different states of South Sudan and create common economic interests.

Representatives from different ministries and institutions participated in the two programs and had the opportunity, for the first time, to plan together potential clusters, and initiate regional decentralization.

Competitive advantage of nations

Availability of low cost labor, and local natural resources could serve as a starting point of a comparative advantage for a developing country, but these cannot generate sustainable competitive advantages over time. Below we present different models of development aimed at generating a sustainable competitive advantage.

Free economic zones (FEZ)

Between 1980 and 1984, China established the first free economic zones (FEZs) in Shantou, Shenzhen, and Zhuhai, in Guangdong Province, and in Xiamen, in Fujian Province, as part of its economic reforms and policy of opening up to the world. China sought to attract international investments based on its low cost of labor in order to start an industrialization process (Mohiuddin et al., 2014). Numerous other FEZs followed, based on the competitive advantage of large-scale production and on specializations such as those in the car industry at the Dalian Free Trade Zone (dlftz.gov.cn/index.aspx) or in electronics and telecommunications at Tianjin Economic-Technological Development Area (teda.gov.cn/html/ewzw/portal/index/index.htm).

Other developing regions and countries used a similar model. The "maquiladoras" in Central America focus on textile, clothing, food, metalwork, electronics, and footwear (Vargas-Hernández, 2011). Added value and the number of direct jobs have grown at an average annual rate of 25% in some Central-American countries (Acevedo, 2008).

Ay (2009) argued that free zones in Turkey do not make a positive contribution to Turkey’s foreign trade, therefore their functions as foreign currency generators are not highly applicable in Turkey, and they remain insufficient in export-oriented development efforts. Foreign investments in free zones have remained low compared to foreign investments in domestic areas. But free zones contribute to reducing unemployment (Ay, 2009). In opposite, according to Kocaman (2007), the free zone experience worldwide and in Turkey indicates that these zones do not increase foreign trade and employment.

The UAE government has established nearly 40 free zones, in which 100 percent foreign ownership is allowed and no taxes are levied. The highest concentration of the free zones is in Dubai, with more than half of the total number of free zones (23), followed by Abu Dhabi (5), Ras Al Khaimah (4), Fujairah (3), Sharjah (2), Ajman (1), and Umm Al Quwain (1). Outside the free zones, local sponsors are needed for foreign companies to set up operations, and foreign ownership is limited to a maximum of 49% (Mina, 2013). Eighty percent of non-oil exports in the UAE originate from the free zones.

Porter’s diamond, SWOT analysis and clustering process

Porter’s diamond (Porter, 1986) model provides an analysis of the “factor conditions” in a given region. Based on “demand conditions,” the model proposes a plan for industrialization around clusters in which related and support industries generate economic development. This model represents the upgrading of the SWOT analysis, at the country level. The SWOT model analyzes the strengths and weaknesses of a firm in order to find the best potential opportunities in the market at the lowest threat.

“Factor conditions” refer to the strengths and weaknesses of a country in human and material resources, including knowledge and infrastructure. “Demand conditions” refer to the opportunities and threats related to the demand composition (market) in a country and to its capacity to request value and anticipate needs. Under the macro and micro economic environment of “firm strategy structure and rivalry,” “supporting and related industries” use the factor conditions to generate clusters and meet demand conditions.

Countries in the first stage of development (World Economic Forum, 2015) are mainly “factor-driven.” Low cost labor and unprocessed natural resources are the dominant basis of competitive advantage and exports. Factor driven economies are highly sensitive to world economic cycles, commodity prices, and exchange rate fluctuations. The basic requirements of such economies are institutions, infrastructure, macroeconomic environment, health, and primary education.

Countries in the second stage of development moved into an “efficiency-driven” stage in which they must begin to develop more efficient production processes and increase product quality because wages have risen and they cannot increase prices. Substantial investment in efficient infrastructure, business-friendly government administration, strong investment incentives, improved skills, and greater access to investment capital make possible significant improvements in productivity. Efficiency is enhanced by higher education and better training, improved market efficiency, labor market efficiency, development of the financial market, technological
readiness, and market size.

Herewith two cases illustrating the first stage and move to the second stage.

Tirupur cluster in the middle of the cotton belt of Tamil Nadu, in southern India (Albu, 1998; Kawthorne, 1995) was based at stage 1 on the local production of cotton. The local ethnic population, the Gounders are known for their progressive approach to agriculture, their affinity with improved technology, changing crop patterns according to market demand and taking pride in toiling in the field along with hired labor with whom they maintain family relations. Chari (2000) has stressed the importance of the Gounder community network as a source of finance and access to it in the industrial development of Tirupur.

At the second stage of development, the industrialization process started. Almost 80% of Tirupur textile exporters come from this traditionally agricultural community. Community connections are helpful, especially in cases of new venture and capital/financing requirements. If someone accepts an order on which he cannot deliver, he passes it on to a fellow community member. Trust and hard work have helped the first-generation entrepreneurs in this agricultural community build companies worth several hundred crores. According to the Tirupur Exporters Association (TEA) there are 1,500 knitting units, 700 units related to dyeing and bleaching, 500 units involved in fabric printing, 300 units involved in compacting and calendering, 2500 units assembling the finished products (the exporters), around 250 units linked to embroidery activities, and 500 units dealing in other accessories (TEA, 2011).

Kotli Loharan consists of two large villages of lohars (iron smiths), situated about five miles to the northwest of Sialkot, Pakistan (medpk.com). All types of metal articles for utilitarian and ornamental purposes are made, such as shields and arms, betel-nut cutters, knives, boxes, plates, and inkstands.

At stage 1 of this economy, traditionally, the lohars of these villages had been employed as armorers and shoesmiths for the army. In 1920, there were about 500 iron-workers in the region (Government of Punjab 1920, p. 125), when British doctors began to have their surgical instruments repaired by the skilled workers in the region. These craftsmen were eventually able to successfully replicate the imported instruments (fpcci.com). The doctors and iron workers were the source of the Sialkot cluster specialized in surgical, dental, and veterinary instruments. Tailoring and barber’s scissors, as well as tools for beauty salons are also produced in the region.

At the second stage, Sialkot started exporting surgical instruments, the Government established the Metal Industries Development Centre (MIDC) in 1941 in order to improve standards and to support the local firms. In the same period, was established the Surgical Association of Pakistan. Currently there are 1000-1200 small and medium-size enterprises in the region, and a labor force of 10-50 employees serves each enterprise in the sector (SIMAP, 2010). This industry employs around half a million workers (SIMAP, 2010-2011).

Countries at the third stage of development move into the “innovation-driven” stage. Wages will have risen by so much that in order to sustain them and the associated standard of living businesses must able to compete with new and unique products, services, models, and processes. The ability to produce innovative products and services at the frontier of global technology, using the most advanced methods, becomes the dominant source of competitive advantage. An innovation-driven economy is characterized by distinctive producers and a high share of services in the economy. Such an economy, based on the twin pillars of business sophistication and innovation, is quite resilient to external shocks.

The Oxfordshire cluster in U.K. illustrates the innovation driven third stage of development. Dr. Martin Wood worked as an engineer in the Clarendon Laboratory, the Physics Department of Oxford University, specializing in very low temperature physics, requiring strong and stable magnetic fields. His function was to manage the “powerful but ageing” engineering facility and design equipment for research scientists. Martin Wood founded Oxford Instruments (OI) in 1959 with Audrey, his wife. Barrie Marson, hired in 1971, began a deliberate process of diversification, expanding the activities of OI into medical, electronic, and industrial-analytical equipment. Between 1971 and 1982, OI grew from 100 to 1,300 employees, and from a turnover of £500,000 to £100 million.

OI developed nuclear magnetic resonance (NMR) systems. NMR spectroscopy is based on the ability of the nuclei of atoms to behave like microscopic magnets. The applications of NMR grew exponentially, from spectroscopy, used mostly in biochemistry, to magnetic resonance imaging (MRI), a diagnostic imaging modality that provides valuable clinical information about the human body.

In 1985, the Oxford Trust. established by Martin Wood and his wife Audrey (sbs and scienceoxford websites), assumed responsibility for encouraging the development science and technology applications (Wood, 2001). They engaged with other firms in the high-tech cluster, with business and public-sector organizations, speaking for and acting on behalf of the high-tech sector, both locally and nationally.

Incubator model

The US National Business Incubation Association (NBIA) defines a business incubator as “a dynamic process of business enterprise development, providing under one roof shared office services, access to equipment, flexible
leases and expandable space” (NBIA website). The main task of the business incubator is to create a positive context by providing management and consulting services, as well as relevant material and financial resources.

Two main organizations initiated the establishment of incubators in developing countries (Bijaoui, 2008), the United Nations Industrial Development Organization (UNIDO) and the EU. UNIDO adopted the concept of the incubator in order to “create a favourable environment for entrepreneurship and the expansion of SMEs” (UNIDO, 2002).

As part of a research project conducted for UNIDO, Dijk (1997; 1999) interviewed entrepreneurs from Burinabe, Burkina Faso, and found that most of them were reluctant to work in groups. When asked whether they would like to participate in joint projects, 50% answered that they refused to cooperate with other entrepreneurs.

Since 2002, the EU has supported the creation of incubators within the framework of the South African GODISA program (www.godisa.net), which aims to support economic growth and creation of long-term employment opportunities by enhancing technological innovation and by improving the productivity and international competitiveness of SMEs. The GODISA program comprises the Pilot Innovation Support Centre, a Pilot Technology Demonstration Centre, and six technology-based incubators, two of which focus on a local specialization, cut flower and nutriceutical industry.

The GODISA case study has shown that incubators that operate in conducive environments tend to be more successful than those that are not situated in such settings. Highly conducive environments for business incubation are those characterized by access to knowledge and financial support, but also by networking (“stickiness” process) (Buyu and Mbewana, 2007).

**Open incubator model toward clustering process**

The regular incubator supports entrepreneurs who seek to move to a shared site and are ready to do it. In an open incubator, the entrepreneurs remain where they prefer to be and are selected based on their business potential, their interest in cooperating with others, and their capacity to contribute to viral economic development (Bijaoui and Regev, 2015).

The open incubator establishes support infrastructure in cooperation with the entrepreneurs who are its main beneficiaries.

The objective is to generate growth based on cooperation-competition between related and supporting firms, members of the open incubator. They are encouraged to organize partnerships that can propose specific activities based on the common interest such as joint exports, development, production, or purchasing.

The open incubator is more than a consultant and less than a group of shareholders. Its role is to create the conditions for a deeper and broader efficient cooperation and positive-competition. It can be initiated by a public or private organization whose objective is to support and improve the bottom-up process toward a cluster.

The open incubator model helps improve the decentralization and clustering processes by selecting SMEs that are able to generate development. Based on local factors and demand conditions, regional authorities cooperate with the private sector and support service providers such as universities, training centers. Investment and export companies also participate in the development of a given sector.

**METHODOLOGY**

Economic development generated by a clustering process requires the cooperation of different ministries, each one in charge of a different part of the puzzle: finance, agriculture, labor, trade, industry, education, natural resources, infrastructure, and many others. We had the opportunity to conduct two focus groups in parallel in South Sudan with representatives of these ministries. The first one, focused on economic strategy, included 14 participants; a second one, focused on public administration and decentralization, included 18 participants. We transferred knowledge about economic development and the clustering process to the first group, and about human capital, innovation, SWOT analysis and decentralization process to the second one.

The first group had to determine which clusters could generate the first and second stage of development in South Sudan as illustrated by Tirupur and Skialot cases.

The second group proposed, at the micro-economic level of regions, specific specializations for open incubators, which could generate local economic development supporting the regional decentralization process.

In the economic strategy program the following organizations and ministries were represented:

- Juba University (2)
- Investment Corporation
- National Audit Chamber
- Anti-corruption Commission
- Urban Water Corporation,
- Employees justice national chamber
- Ministry of Cabinet Affairs
- Ministry of Finance (2)
- Ministry of Health
- Ministry of Foreign Affairs
- Ministry of Education
- Ministry of Labor

A the end of the discussion the participants completed a questionnaire describing their views about the factor and demand conditions of the Porter's diamond in their country, and evaluated their relative importance on a scale from 1 (not relevant), 2, 3 (low relevance), 4, 5 (highly relevant). They proposed potential clusters that could generate common economic interest for most of the population.

In the public administration and regional decentralization program the participants were from the following organizations and ministries:

- Juba University (2)
The Investment Corporation
State Food Security (3)
Independent institution in charge of transparency
Two NGOs
Ministry of Culture and Youth
Ministry of Finance (2)
Ministry of Justice
Ministry of Transport
Ministry of Labor
Ministry of Telecommunication
Ministry of Education
Ministry of Cabinet Affairs

At the end of the discussion they completed a questionnaire proposing domain of specializations for potential open incubators that could serve as the starting point of regional decentralization on a similar scale as the first group.

RESULTS

Porter’s Diamond in South Sudan

Factor conditions

Local natural resources are identified as the best asset for development (64.3 percent, highly relevant), better than low-cost labor (50% highly relevant). The inadequate infrastructure (71.5 percent, low relevancy) has a negative effect on development because of a limited network of roads, no trains and no outlet to sea. Consequently, trade is mainly with the neighboring countries (Uganda, Kenya, Congo, and Ethiopia), and not between regions.

Demand conditions

Fresh products (71.4 percent, highly relevant), and energy products (57.2 percent, highly relevant) are the main components of demand. Processed products, telecommunication, and medical services are not available for most of the population due to poor infrastructure. Most of the processed products are imported from neighboring countries forming a smaller part of demand.

Structure and rivalry

Structure

Literacy is the main problem of the country (69.2 percent, highly relevant), before food insecurity and mortality (61.5 percent, highly relevant). Without education, economic and social development cannot occur.

Rivalry

Governmental involvement is the main obstacle to competition (57.2 percent, highly relevant) because the international support enters to the country through governmental institutions. The large number of SMEs, especially in the informal economy, competing with each other (64.2 per cent, highly relevant), insure competitive prices of fruits, vegetables and meat. Cattle are one of the most important resources of South Sudan. Supporting and related industries.

The economic map of South Sudan shows specific specializations in the different regions. From among these options, participants had to select the ones that could unify the country around common economic interests and serve as a basis for the development of clusters. As can be seen in Exhibit 1, forestry, coffee, and tea are common to the south-east and south-west, vegetable oil throughout the entire regions, rice in the west, center, and the north-east, maize in the north, and gum Arabic in the upper Nile region, close to the Sudan border, the leading world producer.

Exhibit 1: Regional topography of South Sudan and its agriculture

Herewith the three potential clusters with the capacity to generate the first and second stage of development (Figure 1).

Forestry cluster

About 81% of Sub-Saharan African (SSA) households rely on wood-based biomass energy (fuelwood and charcoal) for cooking. Electricity is not regarded a suitable alternative, given equipment and use costs (IEA, 2010).

Currently, the total consumption of wood in Africa is about 700 million cubic meters (m3) per year—with approximately 75 million m3 consumed for industrial wood products and the remaining 625 million m3 consumed for fuel wood including charcoal FAO, 2011) Western and Eastern Equatorial states in South Sudan are the potential base for the forest cluster involved in wood products, wood fuel, and charcoal (Exhibit 2).

The wood-based biomass energy sector employs a significant workforce, providing regular income to thousands of people all around the country who work as small-scale producers or collectors, traders, transporters, and retailers.

Sustaining community-based forest management, including agroforestry systems, is a requisite for developing a forest cluster.

Exhibit 2: States and agricultural specialization in South Sudan

Other related industries have been identified such as...
Figure 1. Regional topography of South Sudan and its agriculture.

Source: Ministry of Agriculture, Forestry, Cooperatives, and Rural Development.

Vegetable oil cluster

The vegetable oil cluster is based on palm in Western Equatoria state and sesame oil in Western and Northern Bahr El Gazal, Warrap and Upper Nile states.

RBD palm oil (unfractionated palm oil) is used for producing margarine, shortening, vegetable ghee, frying fats and ice cream (Ofosu-Budu and Sarpong, 2013). In the production of ice cream, milk fats are replaced by a combination of palm oil and PKO. A blend of palm oil, PKO (Palm Kernel Oil) and other fats also replaces milk fat for the production of non-dairy creamers or whiteners.

Palm oil is the largest natural source of essential vitamin E, and is high in vitamin K and dietary magnesium. Palm oil and PKO are also ingredients for the production of specialty fats, which include cocoa butter equivalents (CBE) and cocoa butter substitutes (CBS) and general purpose coating fats. CBE and CBS have physical properties that are similar to cocoa butter and are widely used for production of chocolate confectionery.

Non-food uses of palm oil and PKO are for the soap, detergent and cosmetic industries. They are also used in the chemical industry for plasticizers and coatings. A recent trend is the usage of by-products, as well as CPO, as energy sources for electricity plants and increasingly as biofuel and biodiesel.
Sesame seed has higher oil content (around 50%) than most of the known oilseeds although its production is far less than the major oilseeds. It is one of the most stable edible oil despite its high degree of unsaturation. The presence of lignan type of natural antioxidants accounts for both the superior stability of sesame oil and the beneficial physiological effects of sesame.

Antioxidants are well recognized to play an important role in the defense against oxidative stress, which may cause damage to membrane, nucleic acid, and protein resulting in circulatory ailments, senility, mutation, and cancer (Halliwell et al., 1995) sesame could act as a stimulus to the liver function, particularly in the endoplasmic reticula (Akimoto et al., 1993)

Gum arabic cluster

Gum arabic is a natural gum produced by acacia trees mainly in the arid zone of Western Equatoria state.

Gum arabic is an important ingredient in soft drink syrups, “hard” gummy candies such as gumdrops, marshmallows, M&M chocolate candies, and edible glitter, a highly popular, modern cake-decorating staple (minerals-water.co.uk website).

Artists use it as a traditional binder in watercolor paint, in photography (for gum printing), and as a binder in pyrotechnic compositions. Its use in intestinal dialysis has also been investigated.

Pharmaceuticals and cosmetics also use the gum as a binder, emulsifying agent, and a suspending and viscosity-increasing agent. It is used topically for the healing of wounds, and has been shown to inhibit the growth of periodontic bacteria and the early deposition of plaque.

Gum arabic is an important ingredient in shoe polish and can be used in making incense cones at home. It is also used as a lickable adhesive, for example on postage stamps and cigarette papers. Printers employ it to stop oxidation of aluminum printing plates in the interval between processing of the plate and its use on a printing press.

Gum arabic is also used as a binder for watercolor painting because it dissolves easily in water. Color pigments are suspended within the gum arabic in varying amounts, producing watercolor paint.

Gum arabic protects and etch images in lithographic processes. Ink tends to fill the white space on photosensitive aluminum plates if a layer of gum is not applied. In lithography, the gum is used to etch the most subtle
gray tones.

Regional decentralization

Participants at the workshop belong to the administration at various ministries and are in charge of implementing the economic policy determined by the directors who participated in the economic policy program. We asked participants to indicate with which open incubators they propose to start regional decentralization.

Regional open incubators are proposed in vegetables, crops (61.1 percent, highly relevant), cattle and food processing (44.4 percent highly relevant) to provide for the basic needs of the population.

Conclusion

The objective of this research was to propose a process of economic development able to overcome conflicts between populations in the different states of South Sudan and create common economic interests.

The participants agreed upon economic strategy based on three main potential clusters (forest-related products, gum arabic and its applications, and palm, sesame oil applications) could move South Sudan from stage 1 to stage 2 of development. These clusters cover all the states, create common interests between populations, and generate long-term competitive advantages.

Open incubators specialized in vegetables, crops, cattle, and further food processing will insure the basic needs in the different states and strengthen the decentralization process generated by the three clusters. The clustering process could start by open incubators. The open incubators solve the problem of current life and insure the subsistence of the population. The three clusters prepare the second phase of development, the industrialization process based on the competitive advantage generated by the efficient use of local resources. We involved the whole populations of the different states, in solving conflicts by higher economic added value for subsistence and a better future.

Conflict of Interests

The authors have not declared any conflict of interests.

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