

## **Challenges in Food Safety and the Possible Solutions Fizi and Mwenga Territory, South Kivu, Democratic Republic of the Congo**

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**ABSTRACT:** *The first and foremost reason of the food insecurity of the eastern Congo regions in question is the state of war. Since this is mostly related to global politics, this aspect is not being detailed in this paper, which is mainly focusing on other problems – problems that already started to surface before the wars – and their solutions. Of course, as the continuous adverse effects of the fights cannot be ignored, a brief introduction of the political situation and its most important consequences on food safety follows.*

**Keywords:** *Congo DRC, Food security, Globalisation, Hunger, War*

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### **I. INTRODUCTION**

Globalisation has become unstoppable, and while certain parts of the world accumulate billions of dollars, other parts have to tackle malnutrition, famine and starvation without either proper quality drinking water or the provision of essential health care (Juhász P. G. – Kanizsay E.2012). Therefore, despite all kinds of attempts, the adequate food supply of hundreds of millions of people is still a problem to be solved. The incredible development of Asia justifies the globalists' arguments. While in the 1960s, most of the continent was characterised by rural-communistic, primitive societies, today there are thriving economies and high-tech countries. In the place of hand-cultivated rice fields, skyscrapers are towering. The corrupt military regimes have disappeared in most places, and young democracies have emerged. Meanwhile, the standard of living has been dramatically increasing.

This paper while shedding light on the political, economic, agro environmental and even cultural reasons of the food insecurity in Fizi and Mwenga territory offers possible solutions as well. It is known that among the 2015 jubilee plans of the UN, the following have priorities: the constant improvement of the developing countries' food supply; the reduction of malnutrition, lack of health care and the number of people living on less than \$1 a day by 50 %. It has been accepted for more than 60 years as a fact that the various subsidies do not serve as solutions to the problem (Juhász P.G. et al. 2006). The experts agree that food production requires its own strategy and at least the staple food should be produced and grown in the developing countries.<sup>1</sup>

### **II. BACKGROUND**

The Democratic Republic of the Congo, the former Zaire, fell into war and chaos in the second half of the 1990s. The bloody conflict of 1998 was followed by another one two years later. The governmental troops supported by Angola, Namibia and Zimbabwe fought the rebels aided by Uganda and Rwanda. Up until today, several "minor" clashes erupted in the area, which still have adverse effects on the lives of millions of people. There are significant efforts and peace agreements aimed at improving the situation of the country, but usually without major success. The insecurity has increased in the areas in question, which are the areas where APIDE<sup>2</sup> and Véto Agro Consul Network (VACNET)<sup>3</sup> operate. Different (officially independent) armed forces have appeared in the mineral-rich areas, due to which the fights for the supervision rights resurfaced. The presence of these irregular troops greatly endangers the stability and safety of the territory.

As a result of the clashes, the number of inland refugees is estimated to be several millions, one million residing in the eastern part of the country. Most of them are women and children.

The children torn away from their families constitute a major problem, especially in the region of Fizi, where they can easily be abused and exploited. Many of them become child soldiers, often voluntarily joining the different armed forces.

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<sup>1</sup> The latter is a research program by acedemist József Bognár on the world food crisis of the 21st century.

<sup>2</sup> APIDE is a local non-profit organization that have been working with 45 villages since 1992

<sup>3</sup> Established in August 1994 and registered as a Congolese non profit organization targeting child protection, food security and income generating activities, <https://vacnetrdc.wordpress.com/nos-produits/>

The severely impoverished population has also been greatly affected economically by the wars. The locals do not share the profit coming from the minerals and other natural resources at all (Nyamatomwa L. M. et al 1997).

- the economic network and the economic activities have suffered great damages
- the basic forms of infrastructure (roads) have been destroyed
- due to the constant insecurity, agricultural activities have ceased to exist
- the armed and irregular forces are regularly pillaging
- the markets cannot operate
- the salaries of government officials have not been paid
- there are several types of currency in circulation, with different exchange rates depending on the areas being controlled by the government or by the rebels
- the banking system has become unable to operate

The overall effect of all of these factors is the drastic decrease in the purchasing power of the population.

The severe social consequences of the wars and political instability are:

- extreme poverty
- destruction of social infrastructure (schools, health care institutions, hospitals, etc.)
- spread of diseases (malaria, worm diseases, HIV / AIDS, etc.)
- lack of food safety, chronic malnutrition (especially among the most vulnerable social groups: pregnant women, nursing mothers, children under the age of five, the elderly, etc.)
- undereducation of children

### **III. THE LOCAL AND CONTINENTAL SIGNIFICANCE OF CASSAVA AND ITS CRISIS**

Experts believe that the conflict has contributed to the spread of the new subtype of the African cassava mosaic virus, the Uganda variant, as the inland refugees took their equipment used for planting from one place to the other. The cassava disease outbreak happened at the worst possible time. During the conflict, approximately 3 million impoverished and malnourished refugees perished, mostly as a result of diseases or starvation. The disease plagues virtually the whole territory. The manioc (cassava) is the most important food crop, therefore the virus is the source of serious concerns in terms of food provision. The disease is spread by the white fly as a vector. It is the most dangerous if it attacks the younger sprouts. The germs can be tackled by resistant species, but the expanses involved are rather high, and with every planting, fresh vegetative stock needs to be provided.

The APIDE contributed 80-meter vegetative stock to each family. This is enough for the forcing of 480 plants. The planting and row distance is 1 meter respectively.

The production time of the plant is long (between 9 months and 1 year). As the plant has a long stem, storm damages are frequent.

On an average, the plant produces 15 tons of crops per hectare.

The program supported 80 families in the village of Musika.

In Sub-Saharan Africa, the lives of more than 240 million people depend on the cassava-based food and on the income coming from it. Cassava is a cheap, calorie-rich food with high levels of protein, A and B vitamins.

The International Institute of Tropical Agriculture (IITA) is leading in the African cassava research to ensure that cassava plays a key role in the successful development.

In 2007, it was of high priority to develop and spread new hybrids with the help of national and international partners. All of these are to reduce the vulnerability of producers and consumers and to increase the crop yields and the profits coming from it.

The better quality cassava hybrids, which are resistant to diseases, can be processed more easily and contain more vitamins and minerals.

The cassava brown-streak disease (CBSD) constitutes a great danger to the cassava production of the whole continent, therefore the development and spread of the resistant hybrids is imperative. The IITA, in collaboration with the Kizimbani Research Institute of Zanzibar, has developed four variants which are resistant to diseases. These resistant hybrids are suitable for consumption and their yields are also high, 20 tons / hectare on average. The Ministry of Agriculture of Zanzibar accelerated the spread of the new hybrids in March 2007, as a response to the increased producer demand.

The new hybrids have made it possible for the small businesses to produce more cassava and it has also become easier to produce flour from it. The price of an 80-kilogram bag is 6 USD, which is half the price of cassava roots of the same amount<sup>4</sup>. The IITA together with its partners would also like to reduce the "hidden hunger" in Africa with the help of the cassava. The most widespread types in the region contain very little protein, which is only 2 % of the dry weight of the plant. The IITA, together with its International Centre of Tropical Agriculture, has developed a cassava type which contains 14 times (28%) more protein than the local types.

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<sup>4</sup> <http://www.cgiar.org/web-archives/www-cgiar-org-newsroom-releases-news-asp-idnews-574/>

The IITA also collaborates with the Harvest Plus Challenge Program, and has plans to create a cassava type with higher levels of protein, beta-carotene and other nutrients. With this nutrient-increased cassava, the hidden hunger can significantly be decreased in Africa, and therefore, in Eastern Congo, as well. The farmers can experience the benefits of the increased nutrients without having to alter their eating or farming habits.

The IITA previously developed a cassava hybrid which is resistant to the disease that plagues Eastern Africa the most. In the early 2000s, the IITA gave this hybrid to the Democratic Republic of the Congo. The fast analysis tests carried out by the scientists of the IITA revealed that the Uganda variant is contagious. With the aid of USAID, a resistant was developed within months, and in 2001, projects were launched to curb the epidemic. Initially, the farmers received the plants only in small quantities to test which type is the most suitable for them. They received cuttings including 200 genotypes, out of which 10 were chosen for fast reproduction and for being distributed among the producers at the Mvuazi Research Center. These types are hoped to become the most important food crops of the Democratic Republic of the Congo.

The most important food crop of the region, the cassava, is grown vegetatively, therefore only the use of clean, uninfected equipment is allowed to avoid the spread of the germs. It is advised to employ careful plant health measures and sterile equipment, but these have all been destroyed during the war<sup>5</sup>.

#### **IV. THE NEW VERMIN: THE CORN BORER**

Another important food crop is corn (Berényi B.-Szabó L.2001). Up until recently, it was not affected by vermin, but today, in several regions, it is impossible to maintain an economical production without the proper insecticides due to the spread of the corn borer. Corn is also plagued by soil erosion, as where the land is not flat, heavy rainfall can wash away the fertile upper soil layer. The production of both plants can become economically efficient if it is organised on an industrial scale, on flat land, with proper mechanisation, genetic material and expertise. With these conditions, the products can easily satisfy the demands of the local markets.

#### **V. THE CRISIS OF ANIMAL HUSBANDRY**

As a result of the war, the number of livestock was reduced to a minimum level. Almost in its entirety, it was pilfered, raided by the gunmen, or eaten by the locals before their fleeing. The few remaining animals perished owing to diseases. As most of the products of animal origin is imported from abroad or from distant areas which are not easily accessible, the prices are extremely high and the products are often unaffordable. APIDE and other local NGOs try to combat the situation with promoting small animal husbandry. In many places, the locals are given guinea pigs and poultry, by the breeding of which the villages are provided meat, eggs (animal protein) and income. The project is in its initial stages. In the promotion of big animal husbandry, both the local and the foreign investors can see potentials. The demand for meat, milk and eggs is extremely high. Some people can afford and is willing to pay multiple times the European prices for certain products.

Recently, certain locals have purchased several dairy cattle from the neighbouring Rwanda at a price of 800 USD each. Unfortunately, for unknown reasons, the cows give only 2-3 litres of milk a day. The causes are being examined. The most likely problem is the inappropriate keeping and feeding conditions, but it can also be possible that the local microclimate is not suitable or the cattle purchased from Rwanda were of poor genetic material. It is imperative to involve skilled experts and to perform prior inspection in all cases, since e.g. swine fever, foot-and-mouth disease and many other diseases can curb the efficient cooperation.

#### **VI. FISH FARMING**

The locals create artificial ponds in many towns by cutting off the springs and brooks with dams, and use the gained water to ensure the living environment for the fish. The technology is of Belgian origin. In the ponds, the fish feed on phytoplankton. Currently it is a serious concern that the area is left unweeded, the proper fresh water supply is not provided, and there is waterlogging, which is ideal for the mosquito larvae, highly contributing to the malaria diseases. The fish stock is genetically poor, since there are no issues provided from Lake Kivu as it was done during colonial times. The fish are not fed.

For the above mentioned reasons, the level of production is low.

With the improvement of an American technology, APIDE has combated the problem. In a complex program, balance has been created between plant production, animal husbandry and fish farming.

Small pools have been created with fresh water being continuously poured into them from above. In this way, the proper oxygen supply is provided. The water is circulated back to the original river bed through drain channels installed on the opposite sides of the pool. This way, there is a continuous circulation preventing the formation of waterlogging.

Issues of fresh genetic material from Lake Kivu are distributed among the fish farmers.

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<sup>5</sup> <http://www.cgiar.org/www-archive/www.cgiar.org/pdf/healingwounds.pdf>

Compost material (organic waste of animal and plant origin) is placed into an isolated part of the pool to satisfy the nutritional needs of the phytoplankton.

Due to these measures, productivity can be greatly enhanced.

The pools are drained every 6 months and the mature fish is sold on the market, while the smaller fish is distributed among the other farmers for the genetic diversification of the ponds.

The residual sludge is utilised as fertilizer in plant production.

The species of fish bred in the pools feeds on mosquito larvae, therefore preventing the spread of malaria.

It is important to note that the fish farming of Lake Kivu is based exclusively on fishing. Many experts believe that the coastline, devoid of any methane content, has great potentials for cage fish farming. The technology is given in Hungary; therefore besides the government of Congo and the permission of local authorities, only investors are needed for large-scale production. The fish can be marketed at a good price on local markets, as well. The hardships of the population were aggravated by the conditions mentioned above. The lack of food safety had precedents before the war, which were due to structural (inconsistent agricultural policies, insufficient and poorly applied systems of information and education) and cyclical reasons as well. As a result, the producers live below the acceptable levels of poverty. It can be observed that there are no environmental obstacles to the efficient production and to the improvement of the food safety conditions. If the political problems and the related economic injustices could be combated, the situation of millions of people (especially that of minors) could be efficiently helped within a reasonable time with systematic and coordinated project work.

## VII. CONCLUSION

The adequate food supply of hundreds of millions of people is still a problem to be solved.

The first and foremost reason of the food insecurity of the eastern Congo regions in question is the state of war. The insecurity has increased in the areas in question, which are the areas where APIDE and VACNET operate.

The manioc (cassava) is the most important food crop. The African cassava mosaic virus plagues virtually the whole territory. The virus can be tackled by resistant species, but the expenses involved are rather high, and with every planting, fresh vegetative stock needs to be provided. The APIDE contributed 80-meter vegetative stock to each family. Another important food crop is corn. It is impossible to maintain an economical production without the proper insecticides due to the spread of the corn borer. The production of both plants can become economically efficient if it is organised on an industrial scale, on flat land, with proper mechanisation, genetic material and expertise.

As a result of the war, the number of livestock was reduced to a minimum level. In a promotion of big animal husbandry, both the local and the foreign investors can see potentials.

The local create artificial ponds in many towns. The technology is of Belgian origin. In the ponds, the fish feed on phytoplankton. The fish stock is genetically poor, since there are no issues provided from Lake Kivu as it was done during colonial times. The fish are not fed.

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