



## CRITICAL FACTORS OF SUPPLY CHAIN MANAGEMENT AND STRATEGIES IN THE FOOD INDUSTRIES

### – Development of a Decision Support System for Strategic Management of Agricultural Raw Material Culture –

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### Abstract

Procurement of goods is increasingly becoming a central theme of our daily life. With the growth of world population and the climate change of our time the subject is omnipresent.

Currently food is often traded through agencies and historically marketplaces. Sometimes it seems that there is no regulation by the lack of market expertise and international regulative. But it is vital that the distribution and price control is placed under supervision. Such Claims as required by various organizations.

Creation of an optimization model with the result of a decision aid for possible introduction of restrictions and for a recognizable impact on the food trade!

What factors should consult organizations such as WHO, FAO, etc. in order to decide possible sanctions in world trade and what action or non action for an optimal distribution, etc. must be taken. This model should be created to explain the scarcity degree of agricultural resource and thus legitimize any penalties or not.

In the top metalevel is the “Metaziel” of sufficient supply, broken down to the lowest metalevel to the optimization of the profits by producers and suppliers.

These limitations are to be used to address a global issue of food allocation, while creating an optimization model for decisions by restrictions of large organizations.

Optimization model as a result: Decision support for possible introduction of restrictions or rejections and thus detectable effect on the food trade in relation to:

- Efficiencies;
- Equities;
- Profits;
- Distributions.



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## Introduction – Markets and Organisations Inside the Ecological Revolution

“No Single date can be pinpointed as the beginning of serious thinking about how organizations work and how they should be structured and managed. One can trace writings about management and organizations as far back as the known origins of commerce. A lot can be learned from the early organization of the Muslims, Hebrews, Greeks and Romans. If we take the time, we could make the case that much of what we know about organization theory has its origins in ancient and medieval times. After all, it was Aristotle who first wrote of the importance of culture to management systems; it was Taymiyyah who used the scientific method to outline the principles of administration within the framework of Islam, and Machiavelli who gave the world the definitive analysis of the use of power.” [Jay M. Shafritz and J. S. Ott, *Classics of organization theory*, 3<sup>rd</sup>, Pacific Grove, CA: Brooks/Cole Pub. Co., 1992]

When talking about food markets (supply and demand) meet different types of organizations:

- Provider;
- Demander;
- Markets;
- Dealer;
- Regulators;
- Legislature.

This project aims to develop a model that combines all these interests and ensure fair distribution, without having to regulate the price. This is the most important criterion that you know how much of a raw material is available, because it controls the supply and demand and hence the price.

Therefore, an optimization and management tool for that decision makers in organizations should be created, so they can get an overview of the IST situation.[Adam Smith and Edwin Cannan, *The wealth of nations: Adam Smith; introduction by Alan B. Krueger; edited, with notes and marginal summary, by Edwin Cannan*, Bantam classic, New York, N.Y: Bantam Classic, 2003]

## Statement of the Problem – The Battle of the Organizations and Individuals for the Agricultural Resources

### Every day new horror stories let us scare up...

The number of people on this earth is increasing, but on the other hand raw materials, especially food, are distributed unequally.[Alexander Sarris, Piero Conforti and Adam Prakash, “The use of organized commodity markets to manage food import price instability and risk,” *Agricultural Economics* 42, no. 1, 2011]

A lot of people don't get any of them, or the prices where you still can get them are growing and growing and growing... [ORF.at, *Warnung vor globaler Nahrungsmittelkrise*, news.ORF.at, <http://orf.at/stories/2008198/2008197>, May 8, 2011]



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### So we all believe...

If humans do not have enough to eat or drink, they would become "uncontrollable". It can not be that many countries are not available to global goods. [ORF.at, *Warnung vor globaler Nahrungsmittelkrise*, news.ORF.at, <http://orf.at/stories/2008198/2008197>, May 8, 2011]

With the delivery of food and beverage people will face survival. It may not be that the levy of a few controls and is impeded from profiteering. [Lorenzo Cotula, *Land grab or development opportunity?*, IIEE, 2009]

A lot of documentations, broadcasts and articles of various media and papers are documenting this. [ORF.at, *China heizt Kampf um Rohstoffe an*, news.ORF.at, <http://orf.at/stories/2008198/2008197>, May 8, 2011]

### So some people and organisations go a further step with their allowances...

A uniform and controlled release must be created; otherwise we face a growing problem. A shortage of plans for other developments, people can do in the back. If the people do not eat or drink enough, they also do not need further plans and lose ambitions and his ideals and standards. [ORF.at, *Yes We Will!*, news.ORF.at, <http://orf.at/stories/2008198/2008197>, May 8, 2011]

The UN Food and Agriculture Organization (FAO) in early June 2010 in their semi-annual "Food Outlook" recognizes that the cost of food imports are rising, particularly in the poorest countries. This now threatens a famine in Africa, because the poorest countries pay more and more for imports. More particularly, the financial burden on food imports as calculated by the UN organization in the world this year to amount to about \$ 100 billion (81.8 billion euros). [OECD Publishing, *OECD-FAO Agricultural Outlook 2010*, Paris: Organisation for Economic Co-operation and Development, 2010]

In return, however, new debts are created to import the daily needs for the people. In particular, the ten million people in the eastern Sahel in West Africa, according to the UN World Food Programme (WFP), are facing a period of starvation. Already, more than one billion people suffer from hunger and malnutrition. Therefore, on a three-day "Conference on Nutrition", FAO, with representatives from the 192 member states in November 2009 set to a five-point plan against hunger. [OECD Publishing, *OECD-FAO Agricultural Outlook 2010*, Paris: Organisation for Economic Co-operation and Development, 2010]

But there are not only reasons of force majeure, such as crop failures and weather conditions, but also political miscalculations and bad decisions, as well as illegal price fixing for ever higher prices. [Björn Lomborg, *Cool it!: Warum wir trotz Klimawandels einen kühlen Kopf bewahren sollten*, 1st ed., München: Pantheon, 2009]

But the increase in biofuels demand raises prices for cereals and rice. More and more people can afford less and less food. A food crisis is imminent, thus expanding the common social life more and more threatened.

In countries like Egypt the meat prices have risen by 50% and threatens riot. And an end to price increases is not clear, as the Food and Agriculture Organisation (FAO) points out. But the fault lies not only in the interests of environmental conditions, but increasingly in the wrong policy.

Price of rice doubled!



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Other countries in Africa are worse affected by the rising prices. Thus, the price of a kilogram of rice in Mauritania, West Africa, doubled in the last three months. At the same time in Zimbabwe, the price of corn increased by 59 percent and in neighbouring Mozambique by 57 percent. In the Democratic Republic of Congo, a portion of fish a year ago cost 10 dollars (8.3 Euros), today it is 25 dollars (20.8 Euros). For a 25-kilogram bag of rice, people must now pay 30 dollars – not for many financially viable. The policy is completely overwhelmed with the demand increase in the consumer society and the related allocation problems. [ORF.at, Reis und Fleisch bald unerschwinglich, news.ORF.at, <http://orf.at/stories/2008198/2008197>, May 8, 2011]

### **But what is the truth...**

Famous critics, such as Bjorn Lomborg, criticize these negative attitudes and campaigns. [Bjorn Lomborg, *Apocalypse no!:* *Wie sich die menschlichen Lebensgrundlagen wirklich entwickeln*, 1st ed., Lüneburg: Zu Klampen, 2002]

In addition to individual Traders there are many other winners by rising commodity prices. Therefore, many welcome this development because the higher commodity prices have also reached to a certain extent of producers. A lot of people (Indians, Chinese,...) can afford more than ever before. [derStandard.at, *Entwicklungsländer holen auf – Arzt und Patient – Gesundheit*, <http://derstandard.at/1288660105435/Fettsucht-Entwicklungslaender-holen-auf>, accessed May 8, 2011]

### **Many questions are open now...**

Do we lose control over our food supply chain and is there no future for food for all?

Do always get less people something to eat in the future?

Or is that only a horror scene, because with fear its easy to earn money...

True to the motto: “If people have fears, they can be controlled better.”

In my dissertation, these developments should be considered from the historical view and compared with current developments. How do these current food stock and different organizations function and who controls them, who are the profiteers and who's ambition?

Through case studies the theme food should be evaluated and restructured in this work. [Josef Zelger and Martin Maier, *GABEK: Verarbeitung und Darstellung von Wissen*, Innsbruck: StudienVerlag, 1999]

### **Solution and answers should be found...**

Creation of an optimization model with the result of a decision aid for possible introduction of restrictions and for a recognizable impact on the food trade! What factors should consult organizations such as WHO, FAO, etc. in order to decide possible sanctions in world trade and what action or non action for an optimal distribution, etc. must be taken. This model should be created to explain the scarcity degree of agricultural resource and thus legitimize any penalties or not. In the top metalevel is the “Metaziel” of sufficient supply, broken down to the lowest metalevel to the optimization of the profits by producers and suppliers; These limitations are to be used to address a global issue of food allocation, while creating an optimization model for decisions by restrictions of large organizations.



## Literature Review

The media circulate a ready-made image and it will be frequently published just more of the negative aspects. This will illustrate the following items.

An article by Eva Obermüller shows clearly that too free access to trade can lead to problems: "Free market led to hunger in Africa. Trade liberalization has, despite the best intentions, brought in some African countries more harm than good. According to a new study the free market led to a decline in food production and to more poverty and hunger". Furthermore, the lead author claims that in many regions of the earth higher prices lead to unrest, as people there spend most of their money for food; mainly affected are the West African countries.

Often there are states that had in recent years increasingly relied on imports and therefore a dependency is created. As long as prices were low, problems arise, but in recent years as commodity prices have increased, this situation was to fall. The high prices led to shortages and riots, often with unfortunately, more and more dead. [ORF.at, *Freier Markt führte in Afrika zu Hunger*, news.ORF.at, <http://orf.at/stories/2008198/2008197>, May 8, 2011]

But which statements and views lead us now to the right conclusion when we bring together all these observations and studies?

This question, if food is really scarce, or whether the scarcity is given as a false front in order to generate more profit, or if such higher prices now are really for the producers of goods and whether the actual situation is much worse than it was in the past, will explore this thesis.

## Methodology

Procurement of goods is increasingly becoming a central theme of our daily life. With the growth of world population and the climate change of our time the subject is omnipresent.

Currently food is often traded through agencies and historically marketplaces. Sometimes it seems that there is no regulation by the lack of market expertise and international regulative. But it is vital that the distribution and price control is placed under supervision. Such Claims as required by various organizations.

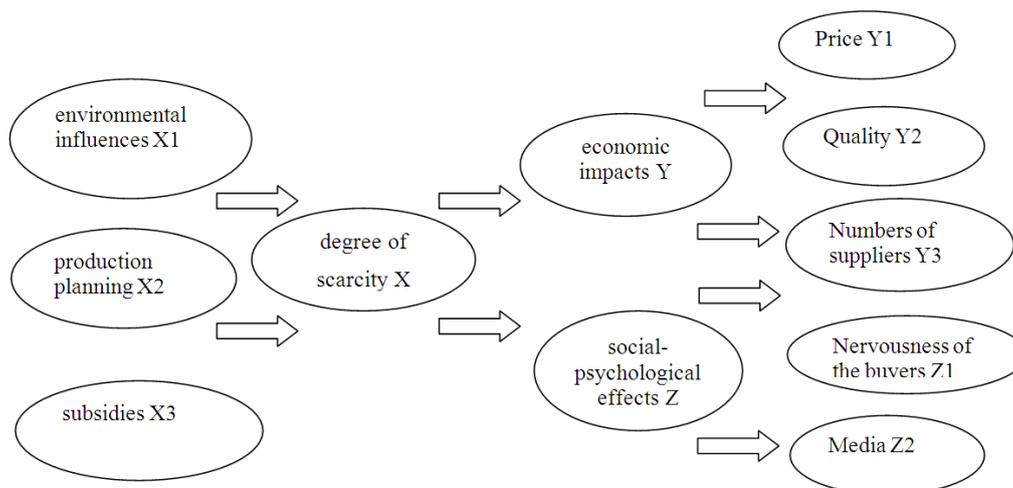


Figure 1. Optimization model



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Structural equation model as an instrument:

H0 = The higher the degree of scarcity, the higher the economic impact;

H1 = The higher the environmental influences are, the higher the price;

H2 = The higher the production planning, the higher the quality;

H3 = The higher the subsidies, the higher the number of suppliers;

H4 = The higher the degree of scarcity, the higher the Nervousness of the buyers;

H5 = The higher the degree of scarcity, the higher the influence by the media.

## Conclusions

### Technical results

We pursue further the issues on which markets are the above foods offered and work these structures and systems?

By which these factors are influenced and how and what factors developed these forms of trade?

In this study, all information should be collected on the basis of case studies and compared to obtain an objective picture of the situation.

This work is considered under the following questions:

How do the food markets, the allocation and the system of organizations of their property work?

With the following secondary questions:

- What factors control these markets and organizations?
- Is intervention by public institutions and organizations like the WTO in the future necessary?

### Personal results

This would be another step in my life, I have to go to learn more about food and its distribution and the involved organizations; I would like to develop myself more and more in the field of international food allocation and organizations and distribution of goods. An area whose future relevance will increase and my activity can be a good contribution to the socio-political responsibility.

Accepting responsibility and to shape the future in a positive way, for me personally it would be very important.



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