# The Application of the Minimum Food Security Quota (MFS-Quota): Malaysia

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**Abstract**

This paper proposes the uses of the Minimum Food Security Quota (MFS-Quota) by Ruiz Estrada (2010). Consequently, the MFS-Quota was applied on the case of Malaysia. The main objective of the MFS-Quota is to calculate the approximate amount of annual food storage that any country needs to prepare for a potential natural disaster or social conflict. Moreover, any country is able to build its own MFS-Quota according to their agriculture production system(s) and its food national policy focus respectively.

## *1. Introduction*

This paper is interested to apply the Minimum Food Security Quota (MFS-Quota) on any country. In our case we applied the MFS-Quota on the case of Malaysia. The purpose of the MFS-Quota is to find the annual percentage of food storage from the agricultural sector total output that can prepare any country for a potential natural disaster or social conflict. Any country is able to build its own MFS-Quota under a safe food security policy framework based on the national basic food consumption(s) (Maxwell, 1996). According to this research paper defined the food security policy as an integral national strategy to monitoring the effective and potential production, storage capacity, and distribution systems (logistic and channels) of agricultural goods that are commonly consumed among the population of any country. It is suggested in this paper that the MFS-Quota can be an alternative approach of analysis in the study of food policy focused on the food security issues. Additionally, we like to mention some interesting research works in our research such as Eele (1994), Gilmore, R. & Huddleston, B. (1983), Carr (2006), and Carletto, Zezza, Bannerjee (2013) about the evaluation of food security policy issues. These four research papers can show us different point of views about the food security policy issues from a qualitative and quantitative perspective. Moreover, this research recommends the uses of a large number of variables that need to be included in the process of constructing the MFS-Quota. All these variables have the same level of importance and are integrated into the same indicator and graphical space. From the mathematical perspective, the MFS-Quota is not a simple relationship between two variables (such as the endogenous variable and the exogenous variable) that are fixed into a specific period of time and space. Hence, the MFS-Quota requires a multi-dimensional variable analytical framework. In this framework no variable is isolated in the mathematical and graphical modeling. A multi-dimensional mathematical economics modeling in real time is used in the construction of the MFS-Quota. This is in order to avoid isolation of any variables in the construction of the MFS-Quota. The multi-dimensional mathematical economics modeling in real time is an alternative mathematical and geometrical approach to observe the behavior of a large number of variables that move within the same graphical space. This type of modeling requires simultaneous application of a multi-dimensional graphical modeling conceptualized under "Econographicology" (Ruiz Estrada, 2007). The multi-dimensional mathematical economics modeling in real time enables observation of all changes in different variables in the same graphical space. All these variables are changing constantly with time (years, months, weeks or days) in different parts within the same space. The application of the multi-dimensional mathematical economics modeling in real time opens up the possibility to formulate a food security policy for any country from a multi-dimensional perspective. The construction of the MFS-Quota varies from one country to another country. It varies according to the diet of the population, population size, geographical location, probabilities of suffering any time from a natural disaster or social conflict and finally, the statistical resources available in the country. In the construction of the MFS-Quota, the presumption is that it is impossible to predict or forecast any natural disasters or social conflict with accuracy relationship between a single exogenous variable and a single endogenous variable.

## 2. *Pro and Cons of Food Security Indicators*

Initially, this research paper is interested to analyze pro and cons of nine different indicators about food security such as (i) dietary diversity (DD); (ii) Coping Strategy Index (CSI); (iii) food adequacy question (FAQ); (iv) non-food factors (NFF); (v) food consumption score (FCS); (vi) household food insecurity access scale (HFIAS); (vii) household survey food consumption data (HSFCD); (viii) undernourishment by Carletto, Zezza, and Banerjee (2013). Additionally, in this section of this research also is willing to identify pro and cons of the minimum food security quota (MFS-Quota) respectively.

| INDICATOR | OBJECTIVE | PRO | CONS |
|---|---|---|---|
| **Minimum Food Security Quota (MFS-Quota)** | MFS-Quota is to find the annual percentage of food storage from the agricultural sector total output that can prepare any country for an eventual natural disaster or social conflict. | The MFS-Quota can easily calculate the approximate amount of annual food storage that any country needs to prepare for a potential natural disaster or social conflict. | Request a huge volume of data sources and a large database. |
| **Dietary diversity (DD)** | The indicator is usually measured by summing the total number of foods or food groups consumed over a given reference period, typically ranging from one to three days. | One of a number of faster measures that have been proposed over the years as an alternative means of capturing food access is dietary diversity, which is of particular importance in developing countries where diets are composed mostly of starchy staples, include few or no animal products, and may be high in fats and sugars. | A primary problem associated with dietary diversity indicators concerns the difficulty involved in interpreting comparisons across studies, since the food groupings as well as the reference periods often vary between approaches. |
| **Coping Strategy Index (CSI)** | The Coping Strategy Index (CSI) is similarly built around a 'behavioral' approach to food security analysis. The motivation for this indicator arises from the recognition that there are several common | The CSI is based on the weighted aggregation of information on the severity and frequency of a certain menu of possible coping strategies, developed and | On the other hand, their penchant for generating false positives creates potential problems, particularly in the context of targeting individuals for food aid in |

| | | | |
|---|---|---|---|
| | behavioral responses to food insecurity that are often used for the management of household food shortages. | assessed based on location-specific assessments and appraisal methods such as focus group discussions. The tool is intended for application (1) in emergency situations to assess the food security situation, (2) for targeting purposes, (3) to serve as an early warning indicator, as well as (4) to monitor the impact of interventions and long-term changes in food security status. | emergency situations. |
| **Food adequacy question (FAQ)** | The food adequacy question (FAQ) have been proposed and implemented in large-scale household surveys. | The advantages of this method lie in its simplicity as well as its ease and rapidity of deployment. | In terms of validation, the sole study of which we are aware that systematically attempted to validate the use of this question involved four multi-topic household surveys in different LDC's, and concluded that this indicator is at best poorly correlated with standard quantitative indicators. |
| **Non-food factors (NFF)** | The level food security outcomes concerns the various non-food factors that contribute to determining those outcomes: health and care inputs, feeding practices, and access to basic services such as clean water and sanitation. | The non-food factors while tried in a few countries with some success, the experience to date has not been particularly encouraging. | Some concerted effort may be needed to achieve consensus on a minimum set of questions and indicators that surveys should include, but this task is well within reach, given the existing degree of harmonization and comparability across some of these surveys in this particular domain. |
| **Food consumption score (FCS)** | A widely utilized variation on the dietary diversity theme is WFP's Food Consumption Score (FCS), which is a frequency- weighted dietary diversity score, calculated using the frequency with which a household consumed eight food groups (i.e., staples, pulses, vegetables, fruits, meat/fish/egg, milk, sugar, and oil) with a 7-day recall from the date of the survey. | The FCS also lacks the ability to differentiate between processed and unprocessed foods, which has implications for food security, particularly in terms of food utilization. | A review and validation of food security indicators by IFPRI in 2006 concluded that the weighting system for the food frequency scores might not be able to accommodate variation across space and time. Further- more, due to the high survey data requirements for creating appropriate weighting factors for a given location and time, the indicator is also unsuitable for emergency assessments, given that the pattern of significant food groups has been found to vary by country and even from one survey round to the next. |

| | | | |
|---|---|---|---|
| **Household food insecurity access scale (HFIAS)** | The Household Food Insecurity Access Scale (HFIAS) is based on the idea that there is a set of predictable reactions to the experience of food insecurity that can be summarized and quantified, allowing for measurement through household surveys. | The HFIAS questions thus represent universal aspects of the experience of food insecurity, capturing information on food shortage, food quantity and quality of diet to determine the status of a given household's access to food. Households and populations can be classified according to the severity of their food security status along a spectrum, by using data on the severity and frequency of their experiences over the previous 30 days. | The authors suggest that more cognitive testing should be conducted in order to capture the experience of uncertainty and anxiety over food supply as it exists in developing country. They also suggest that more testing of the progression of the scale items within the local context could serve to explain minor inconsistencies in their results. |
| **Household survey food consumption data (HSFCD)** | Nonetheless, detailed food consumption expenditure information is the back-bone of poverty measurement in most countries, thus making the collection of this type of data essential for all countries, irrespective of the difficulties and costs entailed. Ensuring that food quantities are collected alongside expenditure information renders possible the applicability and use of this information for food security monitoring and analysis. | While the move to the exclusive use of household surveys to derive global undernourishment figures may not itself be fully practical, more and better food consumption data from household surveys is likely to be a game-changer in improving the FAO undernourishment estimates. | It is important to recognize that the issue of frequency of data is unlikely to be fully addressed on a global scale by household surveys alone, as the likelihood of generating comparable household survey data on a frequent basis from every country is extremely low. |
| **Undernourishment** | To quantify food security at the national level by capturing the average availability of food against requirements at the national level. | The advantage of the FAO measure is that it allows for frequent updated comparisons of energy deficiencies across countries and over time. | The fact that it relies on often poor quality data for the calculation of total food/calorie availability (i.e., the Food Balance Sheets), and on parametric assumptions and often outdated survey data for the analysis of the distribution. An additional drawback is that the official FAO method is not amenable to the analysis of determinants of profiles of food insecurity below the national level. |

**Source:** Carletto, Zezza, and Banerjee (2013).

### *3. An Introduction to the Mathematical Economic Modeling in Real Time*

Multi-dimensional mathematical economics modeling in real time requires the application of the *Omnia Mobilis Assumption* (Ruiz Estrada, 2011) which translated from Latin, means "everything is moving". The *Omnia Mobilis assumption* enables the location of different variables simultaneously in the same multi-dimensional physical space, showing different dimensions and movements in real time. The Ceteris Paribus assumption was commonly applied to food policy modeling in earlier publications in different journals related to food policy and food security policy. This paper suggests contradictory that it is not necessary to apply the Ceteris Paribus assumption to food security policy modeling. Its argument is that no relevant variable should be isolated and considered less important to be accounted in the food policy modeling. The objective of applying the Omnia Mobilis assumption to mathematical economic modeling is to include more variables and not isolate any relevant variable in the food security policy modeling. The multi-dimensional mathematical economics modeling in real time also assumes that the market is formed by many sub-markets. These sub-markets are always in a "*Constant Dynamic Imbalanced State*" (Ruiz Estrada, 2008). The concept of equilibrium in the multi-dimensional mathematical economics modeling in real time is considered as a leak momentum of balance among all sub-markets. It can appear any time, but when exactly this synchronized balance takes place cannot be predicted. From a graphical perspective, the multi-dimensional mathematical economics modeling in real time assumes that a single dependent variable and a single independent variable are non-existence. We only can observe the display of a large, single surface (see Figure 1). This single surface that is formed by a large number of independent variables are joined together in the multi-dimensional physical space. This single and large surface alerts us in case of any positive or negative changes among all variables in the same graphical space.

## 4. *Method to Construct the Minimum Food Security Quota (MFS-Quota)*

The construction of the Minimum Food Security Quota (MFS-Quota) requires multi-dimensional mathematical economics modeling in real time that is conceptualized under "Econographicology." The multi-dimensional mathematical economics modeling in real time is possible with the use of a large general matrix. The following are the steps to construct the MFS-Quota:

- ✓ First Step: the vector input data (v) collected daily on the agriculture production by regions using a standard format.
- ✓ Second Step: transfer the vector input data (v) to different databases (DB) that are connected to a unique information data center.
- ✓ Third Step: plot all vectors input data (v) immediately onto different co-ordinates in the multi-dimensional physical space. One database is created for each of the sources. Some examples of the sources are: the central bank, ministry of agriculture, farms, national statistics departments, and public and private research institutes.

The plotting on each co-ordinate is constantly changing. It is based on the use of multi-dimensional graphical modeling in real time (see Expression 3). Basically, the data is changing in real time. The plotting compares the data between two periods of time: the last period of time (-t) and the next period of time (+t).

## 5. *An Introduction to The Minimum Food Security Quota (MFS-Quota)*

The construction of the Minimum Food Security Quota (MFS-Quota) starts with the construction of an input-output i x j represented by Expression (1).

$$
X_{ij:vn} = \begin{pmatrix} X_{11:v1} & X_{12:v2} & X_{13:v3} \\ X_{21:v4} & X_{22:v5} & X_{23:v6} \\ X_{31:v7} & X_{32:v8} & X_{33:v9} \end{pmatrix} x\ 100\% \qquad (1)
$$

Vn = vector input data **X** = variable(s) **j** = column **i** = row

It is suggested that nine variables of performance represented by a matrix three by three are used. These variables of performance in our model is (i) the large and medium total farms productivity (in tons) average growth rate ($X_{11:v1}$), (ii) imports of capital goods/agriculture average growth rate ($X_{12:v2}$), (iii) exports/agriculture goods (in tons) average growth rate ($X_{13:v3}$), (iv) R&D investment (in millions of US$) average growth rate on the domestic agro-industry sector ($X_{21:v4}$), (v) labor demand and supply in the agriculture sector (in thousands) average growth rate ($X_{22:v5}$), (vi) land demand and supply (in $KM^2$) average growth rate ($X_{23:v6}$), (vii) subsidies to the agriculture sector (in millions of US$) average growth rate ($X_{31:v7}$), (viii) water supply to plantations and farms (in tons) average growth rate ($X_{32:v8}$), (ix) electricity power supply (KW) average growth rate ($X_{33:v9}$). Each variable of performance is based on an average growth rate: Each variable of performance should be based on the uses of average growth rates. The next step is the storing of information in the database (DB) represented by a matrix. (See Expression 2) The matrix consists of information saved in real time (☼) and the application of n-derivative v = $f^{\lambda}(\partial Y_0/\partial X_0, \ldots, \partial Y_\infty/\partial X_{\infty\ldots})$ on each vector input data (v = 1, 2, 3,…,9) and a large number of successive derivatives are running infinite times (λ = 0, 1, …,∞…).

$$DB_{ij:vn} = \begin{pmatrix} ☼\partial X_{11:v1<+t>}/\partial X_{11:v1<-t>} & ☼\partial X_{12:v2<+t>}/\partial X_{12:v2<-t>} & ☼\partial X_{13:v3<+t>}/\partial X_{13:v3<-t>} \\ ☼\partial X_{21:v4<+t>}/\partial X_{21:v4<-t>} & ☼\partial X_{22:v5<+t>}/\partial X_{22:v5<-t>} & ☼\partial X_{23:v6<+t>}/☼\partial X_{23:v6<-t>} \\ ☼\partial X_{31:v7<+t>}/\partial X_{31:v7<-t>} & ☼\partial X_{3:2:v8<+t>}/\partial X_{32:v8<-t>} & ☼\partial X_{33:v9<+t>}/\partial X_{33:v9<-t>} \end{pmatrix} \text{ x } 100\% \quad (2)$$

In the case of the vector input data changes in real time (☼∂) is based on running a large number of partial derivatives simultaneously, we are comparing the data we obtained a day before (**<-t>** = last period of time) and the information of today (**<+t>** = next period of time) according to Expression 3.

$$☼\partial X_{ij:vn<t>} = ☼X_{ij:vn<+t>} - ☼X_{ij:vn<-t>}/\ ☼X_{ij:vn<-t>} \quad (3)$$

The calculation of the final determinant is based on the Expression (4) below under final time of analysis <t>:

$$\Delta\Pi_{ij:vn} = \begin{pmatrix} ☼\partial X_{11:v1<t>} & ☼\partial X_{12:v2<t>} & ☼\partial X_{13:v3<t>} \\ ☼\partial X_{21:v4<t>} & ☼\partial X_{22:v5<t>} & ☼\partial X_{23:v6<t>} \\ ☼\partial X_{31:v7<t>} & ☼\partial X_{32:v8<t>} & ☼\partial X_{33:v9<t>} \end{pmatrix} \text{ x } 100\% \quad (4)$$

The next step is to measure the MFS-Quota by year. Firstly, we need to find the Minimum Food Security Quota Rate (MFS-Quota). To get the MFS-Quota, multiply the final determinant of the matrix of agriculture performance ($\Delta\Pi_{ij:vn}$) by the actual final total agriculture output annually (O%) then divide by the annual population growth rate (ΔPop%) (See Expression 5).

$$\text{MFS-Quota} = (\Delta\Pi_{ij:vn}) \text{ x } (O\%)/(\Delta Pop\%) \quad (5)$$

The final step is to measure the Minimum Food Security Quota (MFS-Quota) final amount: Firstly, we need to apply a logarithm on the expression 5. Hence, the final MFS-Quota-Final-Amount is equal to divide 1 by expression 6 (see Expression 7).

$$\text{Log MFS-Quota} = \text{Log MFS-Quota} \qquad (6)$$

$$\text{MFS-Quota-Final-Amount} = 1/\text{Log MFS-Quota} \qquad (7)$$

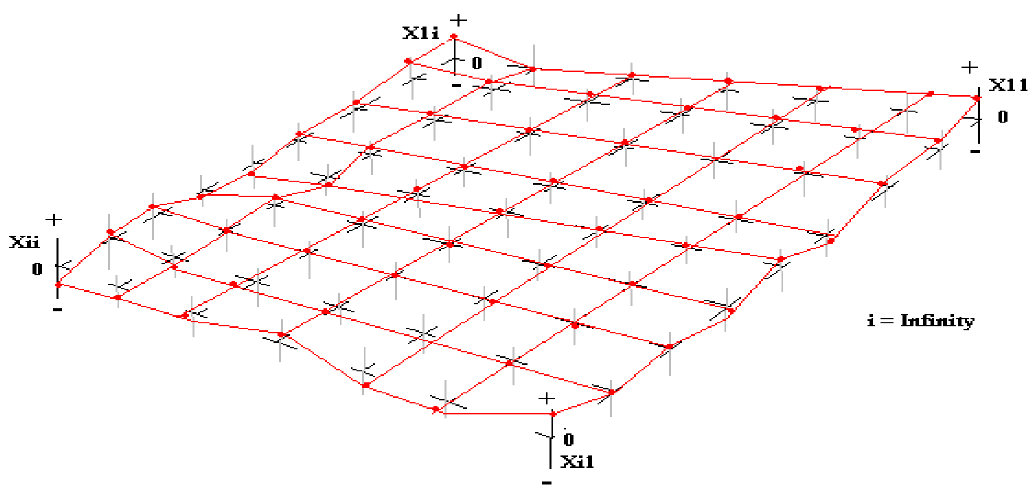
***The Minimum Food Security Quota Surface (MFS-Quota-Surface)***

The full implementation of the MFS-Quota-Surface requires one fourth phase, that is, the construction of the MFS-Quota-Surface. The purpose of constructing the MFS-Quota-Surface is to visualize graphically all results in the MFS-Quota-Matrix variables performance (see Expression 4). The MFS-Quota-Surface allows graphical visualization of strengths or weaknesses points in any research about food security policy modeling (see Figure 1). The construction of MFS-Quota-Surface depends on the MFS-Quota-Matrix variables performance final results. The MFS-Quota-Matrix is a three by three matrix that contains the individual results of all nine performance main-variables (taken from Table 1). The idea is to use results of strictly nine performance main-variables in the MFS-Quota-Matrix to build a symmetric surface. When the MFS-Quota-Matrix keeps strictly the same number of rows and columns, then the MFS-Quota-Surface can always show a perfect symmetric view (see Expression 8).

$$\text{MFS-Quota-Surface} = \begin{pmatrix} X_{11(v1)} & X_{12(v2)} & X_{13(v3)} \\ X_{21(v4)} & X_{22(v5)} & X_{23(v6)} \\ X_{31(v7)} & X_{32(v8)} & X_{33(v9)} \end{pmatrix} \qquad (8)$$

The result of each performance main-variable in the MFS-Quota-Surface is evaluated according to four levels of performance. If the result of the performance main-variable in the MFS-Quota-Surface is between 1 and 0.76, then this main-variable has an 'excellent performance'. If the performance main-variable has a result between 0.75 and 0.51, then it is of 'good performance'. If the performance main-variable has a result between 0.50 and 0.26, then this performance main-variable is of 'acceptable performance'. If the performance main-variable in the MFS-Quota-Surface shows a result between 0.25 and 0, then this performance main-variable has 'non-satisfactory performance'.

**Figure 1**
MFS-Quota-Surface




**Source:** Econographicology (2007)

### *6. The Application of the MFS-Quota: Malaysia*

Malaysia is located at the Southeast Asia region with a land area of 329,847 $Km^2$. Additionally, Malaysia has a small population of 26 million people compare to their neighbors countries such as Indonesia (247 Millions), Philippines (97 Millions), and Thailand (67 Millions). The Malaysian population structure is formed by four large groups such as Malay (60%), Chinese (20%), Indian (10%), and indigenous (10%). On the other hand, the land fertility of Malaysia can be considered on the same level than its neighbors' countries such as Indonesia, Thailand, and Philippines respectively. According to the GDP distribution of Malaysia by production sector shows that the manufacturing sector keeps a 35% of participation into the GDP of Malaysia. The services sector has a participation of 50% and the agriculture sector with a small participation of 15%. Basically, the Malaysian agriculture sector is divided into three large groups, there are: (i) the traditional agriculture products oriented to export; (ii) the nontraditional agriculture products oriented to export; (iii) the basic agricultures products oriented to the domestic market. In our study, the first group (the traditional agriculture sector oriented to export) we are taking in account three goods such as rubber, oil palm, and black pepper in our research. In the second group that is entitled the nontraditional agriculture products oriented to export, we select five goods such as fruits, fishing products, tea, roses, and flowers. Finally, the third group (the basic agricultures products oriented to the domestic market) that is based on seven goods in our research such as rice, beans, local species, beef meat, chicken meat, eggs, and cocking palm oil. According to official reports from the Malaysian ministry of agriculture from 1991 to 2011 (20 years) shows that the first group (the traditional agriculture sector oriented to export) keeps a fast expansion of +33% average growth rate compare to the second group that is represented by the nontraditional agriculture products oriented to export that only keeps an average growth rate of

+15%. In the third group that is fixed by the basic agricultures products oriented to the domestic market that can shows a fast decline of -15% average growths rate respectively. Therefore, the Malaysian agriculture policy is focused on support the first group (large plantations and farms) than the smaller producers for the domestic market. The limited support to the smaller producers for the domestic market is generating the fast expansion of agriculture imported goods. At the same time, the large demand of agriculture imported goods is affecting directly on the balance trade deficit of Malaysia. In fact, the Malaysian agriculture sector became more vulnerable in the short and long run. Hence, this paper proposes the calculation of the Minimum Food Security Quota (MFS-Quota) for national security reasons and potential natural disasters at Malaysia. Additionally, this paper is of the view that the creation of a stable food policy can considerably decrease the vulnerability of Malaysia food security in the case of mega natural disasters or social conflicts in all levels. Therefore, it suggests that any country should take into consideration a wide range of variables of performance such as (i) large and medium total farms productivity; (ii) imports of capital goods/agriculture; (iii) exports/agriculture goods; (iv) R&D investment on the domestic agro-industry sector; (v) labor demand and supply in the agriculture sector; (vi) land demand and supply; (vii) subsidies to the agriculture sector; (viii) water supply to plantations and farms; (ix) electricity power supply, et cetera. This paper maintains that it is necessary to incorporate these sorts of factors in the food security policy modeling in order to formulate strong policies of minimal vulnerability possible. However, it must be assumed that all these factors maintain a constant quantitative and qualitative transformation(s) in different historical periods of the society concerned. According to our model in this study, the final results shows that the average growth rate from 1991 to 2011 (20 years) is followed by: (i) the large and medium total farms productivity average growth rate (+0.18); (ii) imports of capital goods/agriculture average growth rate (+0.27); (iii) exports/agriculture goods average growth rate (+0.26); (iv) R&D investment average growth rate on the domestic agro-industry sector (+0.11); (v) labor demand and supply in the agriculture sector average growth rate (+0.55); (vi) land demand and supply average growth rate (+0.35); (vii) subsidies to the agriculture sector average growth rate (+0.12); (viii) water supply to plantations and farms average growth rate (+0.30); (ix) electricity power supply average growth rate (+0.27) (see Table 1 and Figure 2). According to our final results Malaysia shows a coefficient (determinant) ΔΠ of 0.257 (≈ +0.26). This determinant (ΔΠ) is calculated in the Table 1.

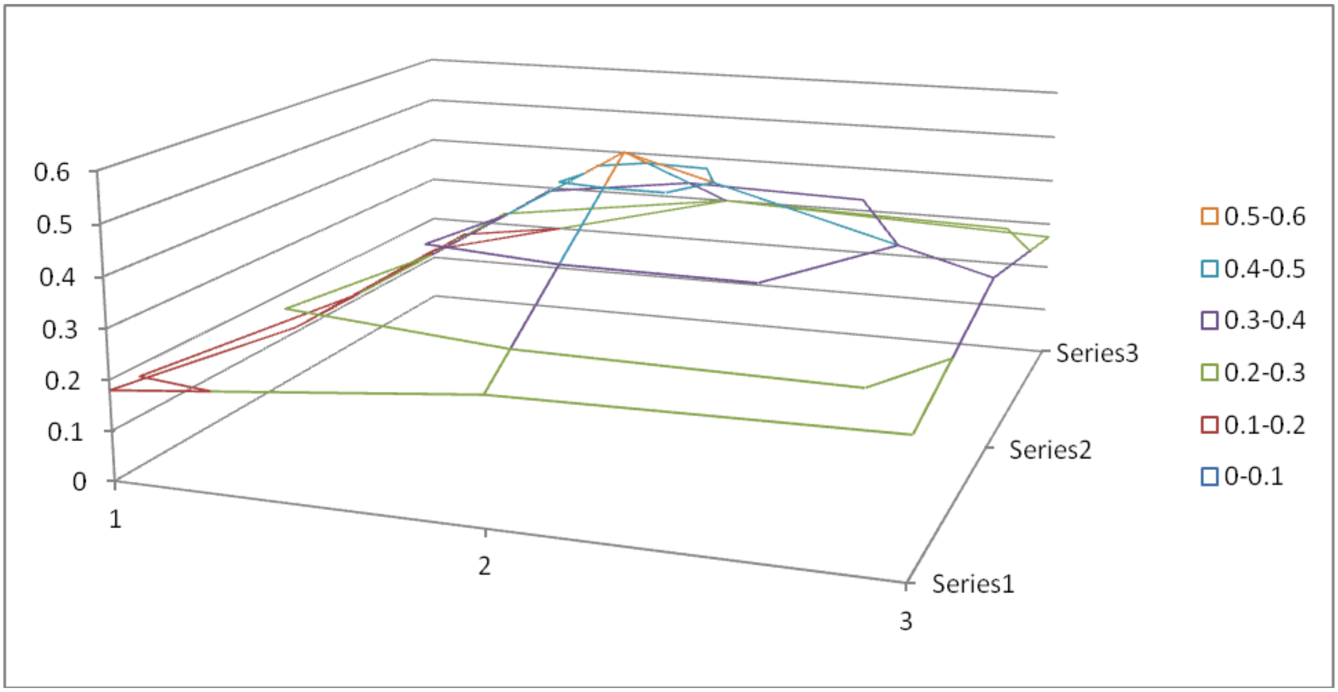
**Table 1**

Calculation of the MFS-Quota: Malaysia (1991-2011)

$$\begin{pmatrix} +0.18 & +0.27 & +0.26 \\ +0.11 & +0.55 & +0.35 \\ +0.12 & +0.30 & +0.27 \end{pmatrix} \text{ X } 100\%$$

| | |
|---|---|
| ΔI = | **0.257 ≈ +0.26** |
| ΔPOP% = | **0.016** |
| Op%= | **0.150** |
| MFS-Quota | **2.41** |
| Log MFS-Quota | **0.16** |
| MFS-Quota (annual) | **2.61%** |

**Figure 2**
MFS-Quota-Surface: Malaysia (1991-2011)




**Source:** Bank Negara Malaysia; Department of Statistics, Malaysia; The Malaysian Government's Official Portal; Ministry of Agriculture and Agro-Based Industry Web Site; World Bank

To build the MFS-Quota-Surface (see Figure 2), we are using the MFS-Quota-Matrix performance variables from Table 1. The MFS-Quota-Matrix is build by nine performance variables are followed by (i) the large and medium total farms productivity average growth rate; (ii) imports of capital goods/agriculture average growth rate; (iii) exports/agriculture goods average growth rate; (iv) R&D investment average growth rate on the domestic agro-industry sector; (v) labor demand and supply in the agriculture sector average growth rate; (vi) land demand and supply average growth rate; (vii) subsidies to the agriculture sector average growth rate; (viii) water supply to plantations and farms average growth rate; (ix) electricity power supply average growth rate respectively. According to the MFS-Quota requests the uses of the population growth rate (ΔPOP%) of Malaysia. According to world bank' the population growth rate of Malaysia in year 2011 is equal to 1.60% (≈ 0.016). The time of food sustainability (T) in the MFS-Quota for Malaysia is equal to 14 days. It is means that Malaysia is available to survive for 14 days (≈ 14) without any worries (3 meals per day) for 85% of Malaysians in any natural disaster or social conflict. If we apply our formula MFS-Quota (annual) then we get a final result of 2.61%. This result explains to us that Malaysia need to storage or safe food monthly 2.61% from the total output of the Malaysian agriculture sector. Hence, the Malaysian government and private sector need to coordinate actions with a general policy (technical aspect) and institutional coordination (implementation aspect) to storage 2.61% from the total output of the agriculture sector annually. In the case of Malaysian total output of the agriculture sector has a share that is equal to 15% from the total GDP by production sector (see Table 1). According to MFS-Quota-Surface for Malaysia is possible observe a non-satisfactory performance in (i) the large and medium total farms productivity average growth rate (+0.18); (iv) R&D investment average growth rate on the domestic agro-industry sector (+0.11); (vii) subsidies to the agriculture sector average growth rate (+0.12). In the case of (ii) imports of capital goods/agriculture average growth rate (+0.27); (iii) exports/agriculture goods average growth rate (+0.26); (vi) land demand and supply average growth rate (+0.35); (viii) water supply to plantations and farms average growth rate (+0.30); (ix) electricity power supply average growth rate (+0.27). The last five performance variables were mentioned before there are keeping an acceptable performance according to our parameters. However, in the case of (v) labor demand and supply in the agriculture sector average growth rate (+0.55) is the only performance variable that keeps a good performance in the last twenty years.

## *7. Policy Recommendations*

The idea to create the Minimum Food Security Quota (MFS-Quota) is to build a practical indicator about food security policy modeling respectively. Therefore, the contribution of this paper can be considered an alternative indicator in food policy modeling for researchers, policy makers and academics. In the evaluation of food security policy modeling this paper is considering three important factors: First factor is that the absence of new variables, including unforeseen and intangible forces, can cause a high level of vulnerability in the food security policy modeling. Second factor, the application of Omnia Mobilis assumption (everything is moving) can help in the food policy modeling to include more variables and not isolate any relevant variable in food security policy modeling. And the last factor is that this paper proposes an indicator "Minimum Food Security Quota (MFS-Quota)." The Minimum Food Security Quota (MFS-Quota) can show clearly the strengths and weaknesses of any food policy modeling from a multidimensional perspective. The MFS-Quota is available to fix the amount of food that any country need to storage for any natural disaster or social conflict. It is possible to be observed in the case of the MFS-Quota for Malaysia that they need to storage annually 2.61% from the 15% of the total agriculture total output. If Malaysia is able to storage a basic basket of commodities such as rice, palm oil, and sugar annually from the agriculture total output a share of 2.61% then they can supply food perfectly for fourteen days to 85% of whole Malaysians according to our indicator. Finally, this indicator can facilitate the planning of the Malaysian food security policy in next few years for national security reasons in the case of eventual natural disasters or social conflicts.

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