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# Empirical Analysis of Agricultural Productivity: Growth in Benin and Mainly Factors Influencing Growth

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# Introduction

■ Agriculture is for country growth, poverty alleviation, employment and household incomes generating sources.

■ Benin agriculture growth and TPF vary ( 1,9% of growth from 1961-1980 and 2,93% from 1981-2001 (Flavio Avila; Robert Evenson, 2001).

■ several reforms and growth instability problems under different political administration : colonial (before 1960), freedom (1960-1972) and revolutionary (Marxist-Leninist) (1972-1990) and liberal since 1990 to today.

➤ During colonialism, food production had low interest and major crop was palm oil.

➤ During the Marxism regime: food interest and the sectoral strategically of development was abandoned in favor to integrated rural development policies;

➤ from 1990, sector liberalized for private management

➤ In 1999, programme of agricultural sector restructuring (PASR) followed by policies of national political of women farmers promotion started from 2001.

# Introduction

Favorable agro-climate potentiality for high output but :

- Production is insufficient to achieve food security;
- Household incomes and productivity still low and the labor force is only partially recovered;
- non competitiveness of agricultural products;
- Use of low yielding Agricultural technologies, and
- Predominance of small farms with lack of financial credit, lack of technology, high input costs.

The socioeconomic development at Benin relevant questions for agricultural policy makers such as efficiency.

The objective of this study is to evaluate Benin agriculture productivity under reforms and identify major factors which influence the sector productivity.

# Methodology and data sources

- DEA methodology (David & Paker, 1998) to calculate Efficient Change (EC) and Technical Change (TC) across the country (12 provinces) compute with DEAP (Data Envelopment Analysis Program 3.2 version)

- Available time series data collected from several sources (PP/MAEP, INSAE, Benin FAO Stata, INRAB etc...) during the period 1999-2003 with constant crops price of 2000 to compute output data.

Output data : grain production; cash crops production; animal production and other crops production for each province and each year from 1999-2003.

Input data : irrigated proportion; labor proportion ( number of provincial agricultural workers at year-end); draft animal (reported in number of head); fertilizer (measured in tons of effective content for nitrogenous, phosphate, potash, and complex fertilizers); and power (kilowatts of engine power capacity).

- Regression method, evaluate major factors influencing the TFP.

output  $Y = \text{TFP}$  cover 43 years (1961-2008)

Input : Conflict (International Peace Research Institute, Oslo); corruption and government effectiveness (Governance Matter II); Land Quality (Peterson, 1987); Public health and Education which was used as a proxy for quality of labor (Center of International Development, Harvard University), available water resources (rainfall data will be collected from AMMA database), AGROSTAT Information on agricultural production (Crop and Livestock index) and means of production such as total rural population and total agricultural area get from world resources institute (WRI) database

## Result and discussion

■ Agriculture output value per hectare changed across all the 12 provinces at Benin from 1999 to 2003 :

Atacora have high output value at 1999/2000; Littoral in 2000/2001.

■ Atacora has the largest irrigated area, Mono the large agriculture labor force, Couffo with high draft animal and fertilizer used and littoral high power used.

■ Agriculture potentiality non-uniformity across all provinces.

■ From DEAP result (see Annex4) show:

✓ After the reform implementation in 1999, technical and productivity changed was high at Borgou, lowers at littoral, fall with the high rate at Colline and lower at littoral region.

✓ Mean of TEC and EC has increase across provinces.

■ Technical and financial partner effort has been increase in the country and more in vulnerable area.

■ The colline region is limited by natural resources, vulnerable to climate change effect and effort has been improve in most vulnerable region across all the country.

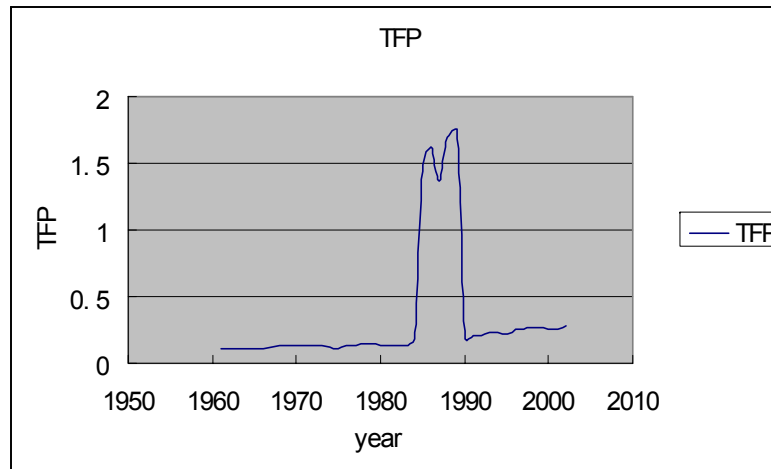
■ Efficient agriculture resources has been allocated to produce output.

■ Exception for some region such as Oueme, Plateau where agriculture resources potentialities were very high.

# Result and discussion

However, the variation was not uniform across the country .

Table1: Benin TFP variation from 1961-2003



Regression equation is given as follow:

$$Y = -8.05 - 1.30E-6 X3 + 8.33 E-6 X5 + 0.55X7 - 2.22X9$$

**R=0.77 DW=1,056.** X3(land),x5(labor),X7(Government effectiveness, X9(Country Openness).

The analysis of the graph of Annex6 show : positive residues and correlation between the TFP and the land quality, agriculture labor force, government effectiveness and the country openness.

Technical efficient change and technological efficient change optimization across provinces and the inefficiency observe in such province is due to non sufficient land use, lack of agriculture labor force used optimization, insufficiently government policies implementations by the liberalization of agriculture sectors

# Conclusion

Important findings on level and trends in Benin agricultural productivity and further examined in one the technical efficient change and technological efficient change across all Benin province and in another hand the political economics of agricultural productivity at Benin between 1961 and 2003.

Technical and technological change has increase across all Benin provinces under reforms but:

- not efficient according potential agriculture available resources( Oueme, Plateau, Borgou, Zou, and Mono) where the agriculture resources available are high.
- Productivity is more efficient in low agriculture available resources are climate change vulnerable region.
- The growth was found to be technological progress rather than efficiency change.
- After open market and liberalization of the sector, the political economic on productivity change revealed that activities of rural development policy implication was not effective action.
- land quality, agriculture labor force, government effectiveness and the country openness has considerably influenced Benin agriculture TPF so on technical change and technological efficiency change.

# Policies

- policies should be implemented to help rural farmers to mitigate climate change negative effect on agriculture resources utility in each province.
- Effort should be managed essentially in north for land revalorization and increase to farmers land use facilities with technologic transfer to farmers.
- Local farmers climate change adaptation methods should be developed or improved to limit the high input cost and maximize the agriculture resources allocated to produce output.
- Land reform should also be improved
- Government should be more engaged in agriculture sector by collaborate with private sectors and for more investment.
- Government should manage agenda with private sector to implement more policies in rural area by rural infrastructure building (solicited their contribution), Public investment (rural roads, marketplaces and storage facilities; irrigation infrastructure; soil fertility improvement anti-erosion measures, mechanism fertilizer substitutes and research by providing more technical support to rural farmers with technology transfer.
- Investment to increase competitiveness of agriculture and other non-resource based sectors and ensure social stability and cohesion.
- More investment in climate change mitigate effect research should be addressed to increase available land for sustainable agriculture growth.
- The government openness should be more sufficient by elaborate more policies that could encourage more private investment in agriculture sector but also should control flow of agriculture trade across the country and with abroad.

# Policies

- Government effectiveness should target more regions with participative approach.
- Government action in agriculture or rural development project should target more need peoples and without corruption. Decentralizations real implementation of will be a good issue of central government objectives.
- Policies should be put in place for agriculture market (largely due to a frail private sector), efficient investment in infrastructure, reduce high transportation costs, improve information systems for producer as consumer, increase capacitated from investing and specializing in new and high value products.
- Policies to control agriculture products commodity prices and there put in place mechanisms that can help minimize or share the risk borne by producers.
- Policies should be address to use this labor and reduce the stubble clearing.
- Rural migration management policies should be address to control city overpopulation e.g.e Cotonou population rising recent year by the number of motto driver<**Zemidjan**>.
- Government should work with the private sector to use more the local labor force and promote more employment.
- Government should also manage effort to create in all local area" public labor" labor force that could be use for public work in agriculture and others rural development sector.
- Benin and foreign aid agencies should channel their resources to provide access to education for more poor people and for capacity building.

Thank u

Merci

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Gracias

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