

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

*In the Name of Allah
The Compassionate
The Merciful*

**COMPARATIVE ADVANTAGE OF
MAJOR CROPS PRODUCTION
THROUGH POLIYC ANALYSIS
MATRIX (PAM) IN PUNJAB**

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FORMAT

- **Introduction** – Agric. in the economy of Pakistan, Major Crop Production
- **Problem Specification**
- **Methodology** – Econ. Incentives, NPR, Effective Protection Rate (EPR), Comparative Advantage, Policy Analysis Matrix (PAM)
- **PAM Results** – NPC, EPC, and DRC
- **Summary and Conclusion**
- **Questionings**

INTRODUCTION ...

- **Agriculture main sector of the economy**
 - **23 % GDP**
 - **ahead of manufacturing sector**
 - **Employing 42 % of total employment**
 - **Major source of foreign exchange earning**
 - **Raw material and labor force to industrial sector**

INTRODUCTION ...

- **Agric. Growth rate 4.5 %/annum (last ten years)**
 - During 2005-06**
 - **Agric. Growth 7.5**
 - **Major crops 37% value added**
 - **Minor crops 12%**
 - **Livestock 47%**
 - **Other (Fisheries 1.3 and Forestry 2.5%)**
- **Wheat, rice, cotton and sugarcane – 91% value added and 32 % in overall agric.**

... INTRODUCTION

Problem Specification

Social or econ. profitability deviate from private profitability because of distortions in:

- factor and output markets
- externalities and
- government policy interventions

→ tends to distort relative prices

... INTRODUCTION

**Necessary to assess the comparative advantage
of production of major crops in Pakistan**

→ efficient crop production

Objectives ...

- a) Determine comparative advantage and competitiveness of major crops (Wheat, Rice, Sugarcane, Cotton) in Pakistan**

- b) Assess whether Pakistan qualifies for export of wheat, rice, sugarcane and cotton and/ or should produce wheat, rice, sugarcane and cotton as import substituting strategy**

...Objectives

- c) Measure the effect of policy incentives that might have favored or discriminate against crop production**

METHODOLOGY ...

Measures of Economic Incentives affecting relative incentive in agriculture:

- Price and subsidy policies**
- Import and export policies**

→ more general macroeconomic policies i.e. exchange rate and interest rate policies

Nominal Protection Rate (NPR)

The amount by which the domestic price of a tradable output deviates from its border price. It is stated as:

$$\text{NPR} = (P_o^d / P_o^b) - 1$$

P_o^d is domestic producer price of a tradable agric. product o,
 P_o^b is the border price of o

Evaluated at the official exchange rate, adjusted for quality, transport, storage, and other margins, measured under competitive condition, and expressed in local currency

→ A positive NPR implies price protection and positive incentive for the production of the commodity

Farm level and wholesale/consumption price

Effective Protection Rates

EPR measures net effects on the value-added of the agricultural product

$$\text{EPR} = (V_o^d / V_o^b) - 1$$

Where:

V_o^d = Value added in domestic price

V_o^b = Value added in border prices expressed in local currency

→ A positive EPR therefore, implies that a particular production activity is receiving a positive incentive through protection at the existing exchange rate and trade policies

Measures of Comparative Advantage

Domestic Resource Cost (DRC): The DRC of foreign exchange earned or saved from a particular production activity can be expressed as the ratio of domestic (nontaxable) factor costs in shadow prices per unit of output to the difference between the border price of output and foreign (tradable) costs (both expressed in foreign currency)

Those activities with the smallest DRCs display the greatest relative comparative advantage

Domestic Resource Cost (DRC)

$$DRC = \sum a_{at} V_{nt} / P_o^b - \sum_{at} P_t^b$$

Where as:

a_t = units for tradeable inputs

a_{nt} = units of non tradable inputs

V_{nt} = shadow price of non-tradable inputs /domestic resources.

P_o^b = border price of tradable output

P_t^b = border price of tradable inputs

PAM ...

Policy Analysis Matrix (PAM) - Monke and Pearson, 1989

- **Relate comparative advantages and policy effects.**
- **Conceptual works emanating from cost-benefit analysis and the theory of international trade**
- **An economic activity in a given country has a comparative advantage as far as it can compete with alternative source of supply through import without benefiting from any specific support from the rest of the economy under the form of transfer of resources**

PAM ...

	Revenue	Tradable Input	Domestic Factor	Profit
Private prices	A	B	C	D
Social prices	E	F	G	H
Policy transfer	I	J	K	L

- a. **Private Profit (D) = A-B-C**
- b. **Social Profit (H) = E-F-G**
- c. **Output Transfer (I) = A-E**
- d. **Input Transfer (J) = B-F**

- e. **Factor Transfer (K) = C-G**
- f. **Net Transfer (L) = D-H = I-J-K**

Ratio indicators for comparison of unlike outputs are:

- **Private Cost Ratio (PCR) = C/ (A-B)**
- **Domestic Resource Cost Ratio (DRC) = G/ (E-F)**
- **Nominal Protection Coefficient on Tradable Output (NPCO) = A/E**
- **Nominal Protection Coefficient on Tradable Input (NPCI) = B/F**

...PAM

The PAM indicators for assessing the efficiency and the comparative advantages of a system:

- **If $D > 0$ the system generates profit under the current policy and market conditions and is competitive.**
- **If $H > 0$ the system would be able to make profit even without benefiting from subsidy or constrained by taxes, and the system is said to be comparative advantage.**
- **If a system is benefiting from input use, or has to pay higher prices for labour, the system can be competitive i.e. $D > 0$, while having no comparative advantage i.e. $H < 0$**

PAM RESULTS ...

Nominal and Effective Protection Coefficient (Avg. 5years)

Crop	NPCs = A/E	EPCs = (A-B)/(E-F)
Wheat	0.75	0.52
Basmati	1.76	0.56
IRRI	1.16	1.19
S.C (IPP)	0.95	1.51
S.C (EPP)	1.50	0.89
Cotton (IPP)	0.81	0.68
Cotton (EPP)	1.07	1.02

... PAM RESULTS

Domestic Resource Costs (DRC) Coefficients (Avg. 5years)

Crop	DRCs = G/(E-F)
Wheat	0.53
Basmati	0.68
IRRI	1.75
S.C (IPP)	0.67
S.C (EPP)	1.02
Cotton (IPP)	0.41
Cotton (EPP)	0.67

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CONCLUSIONS AND POLICY IMPLICATIONS

- **PAM - to assess the competitiveness and comparative advantage of major crops i.e. wheat, rice, sugarcane and cotton production in Punjab (Pakistan)**
- **Whether the Pakistan for export or produce for self sufficiency**
- **Economic efficiency in different majors crop production in Punjab during the years 1999-00 to 2003-04 - estimating NPC, EPC and DRC.**

CON. & POLICY IMPL. ...

- NPC - wheat not received any protection
- Prices received below the import parity prices
- The EPC also determined the same conclusion drawn from NPC, but the implicit tax on the producers under importing of wheat situation was higher than the NPC estimation.
- The DRC for wheat < 1
- Overall PAM results - Comparative advantage in wheat production for self sufficiency - Not for export purpose

...CON. & POLICY IMPL.

- **Basmati – no protection - NPC < 1**
- **The EPC also supported the conclusion drawn from NPC.**
- **The DRC < 1 - Basmati production comparative advantage**
 - **US\$ one earning domestic cost < 1**
 - **increasing basmati production for exports is an economic proposition.**

...CON. & POLICY IMPL.

- **IRRI rice - NPC & EPC for Punjab are > 1**
→ protection to its production.
- **DRCs > 1 during the study period**
→ the given input-output relationships and the prices in exports markets, Punjab did not have comparative advantage in producing IRRI for exports.
- **NPCs S.C importing scenario < 1 (2001-02 & 2002-03)**
→ cane growers did not receive economic prices during these years.
- **2003-04 crop year NPCs > 1**
→ support to the cane growers as the prices received $>$ the import parity prices.

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... CON. & POLICY IMPL.

- **NPCs estimated under exporting situation are > 1**
→ that prices realized by the growers have been $>$ the corresponding export parity/economic prices.
→ S.C production for exporting sugar is not an economic proposition.
- **Cotton - NPCs (export scenario) close to one or > 1 (importing situation) < 1**
→ expansion in cotton production has comparative advantage as the imports have more expensive than the domestic production.

... CON. & POLICY IMPL.

- **↑cotton cultivation → local needs and earn foreign exchange.**
- **Concerted efforts need to be made to improve performance of production and processing sectors, policies conducive to cotton production in the province also seem important.**
- Punjab province should not produce wheat for export given the current conditions and policies. The export of wheat is an efficiency loss of scarce resources that might be used to produce other more socially profitable products or needed crops.

THANKYOU
VERY MUCH