

## **MULTIFUNCTIONALITY OF AGRICULTURE: THE ROLE OF SOCIAL SCIENCE IN IDENTIFYING THE BEST POLICY**

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### **ABSTRACT**

Social science has been playing extremely important roles in addressing issues associated with multifunctionality of agriculture. OECD's work on multifunctionality was one of these attempts, in which rigorous analytical framework based on micro economic theories contributed to narrowing the gap between importing and exporting countries as to how these issues should be addressed.

Agriculture is providing both commodity outputs (e.g., food and fiber) and non-commodity outputs such as landscape, flood protection, biodiversity preservation and food security. Multifunctionality of agriculture refers to the situation where these non-commodity outputs are being provided to society through the production of commodity outputs.

Multifunctionality of agriculture might not be a major policy issue when the economy is closed to the other countries. In a closed economy, demand for food needs to be met by domestic production, and therefore non-commodity outputs could also continue to be provided through domestic production of commodity outputs. In an open economy, however, domestic production of food might be reduced by the increase of importing food, which in turn could reduce the provision of non-commodity outputs.

Multifunctionality of agriculture had been one of the biggest policy issues that had divided countries into two extreme positions; one is the position that non-commodity outputs could be preserved only by preserving the domestic production of commodity outputs, and the other one is that non-commodity outputs could be provided by non trade distorting measures such as those categorized into Blue Box of the WTO agricultural agreement.

OECD's work on multifunctionality tried to bridge the gap between these two positions, by establishing an analytical framework based on the rigorous economic theories. Another characteristic that features the work and is as important as being rigorous was that the analytical framework used languages that could be shared by policy makers. This also contributed to constructive policy discussions.

More specifically, the analytical framework defined three questions for policy makers. Only if all of the answers to these three questions are "yes", could the government support to domestic production be justified, and the types of the support need to be determined by the degree of jointness and public good characteristics of non-commodity outputs.

The first question is about jointness between commodity and non-commodity outputs, which asks whether there is a strong degree of jointness between commodity and non-commodity outputs that cannot be altered, for example, by changes in farming practices and

technologies or by pursuing lower cost non-agricultural provision of non-commodity outputs? If the answer is no, non-commodity outputs could be separated from commodity production, and there would therefore be no need for supporting domestic production of commodity outputs.

If the answer to the first question is yes, the next question to be raised is whether there is some market failure associated with the non-commodity outputs? Even if there is jointness and decrease in domestic production of commodity outputs due to trade, economic gains obtained through trade could exceed the loss of non-commodity outputs caused by the decrease in commodity outputs. If this is the case, there would be no need for policy intervention to the domestic production of commodity outputs.

If the answer to the second question is yes, agricultural trade would reduce the level of domestic production of commodity outputs, which would lead to the net welfare loss in the country. Then we need to ask whether non-governmental options (such as market creation or voluntary provision) have been explored as the most efficient strategy? This is because the justification for supporting domestic production does not guarantee that government is the most efficient in doing so.

Finally, and only if the answer to all these questions is “yes”, then the most efficient interventions will be defined by the nature of the jointness that exists on the supply side and by the different public good characteristics of the non-commodity outputs on the demand side. Various options, including central government provision, local government provision, provision through taking advantage of consumption relationships, club provision, and community provision should be carefully examined.

Transaction costs, including administrative costs associated with various options should also be taken into account. The lack of information could also affect the choice of policy options. Stability and equity concerns should also deserve careful consideration.

## **KEYWORDS**

Analytical framework, Non-commodity outputs, Jointness, Public good, agricultural trade

## **REFERENCES**

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BACKGROUND

- 1998 OECD' Agricultural Ministers' Meeting
  - Ministerial Communiqué stated that agriculture provides multiple outputs: Non-commodity outputs
    - to contribute to the socio-economic development of rural areas including the generation of employment opportunities through its multifunctional characteristics, the policies for which must be transparent, and
- 1999-2003 OECD' Work on Multifunctionality
  - 2000: An Analytical Framework
  - 2003: The policy implications
- 2003- Post policy work
  - Transaction cost
  - Institutional arrangements

COUNTRIES HAVE DIFFERENT PERSPECTIVES ON MF

	Japan	EU	Korea	Norway	Swiss
Landscape	○	○	○	○	○
Biodiversity	○	○	○	○	○
Cultural Heritage	○	○	○	○	○
Flood protection	○		○		
Groundwater Recharge	○		○		
Food security	○		○	○	
Regional Viability	○	○	○	○	○

THE POLICY ISSUE

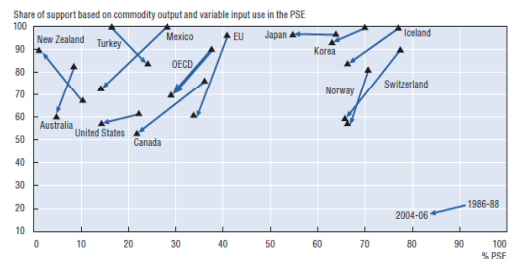
- Importing countries
    - were worried about losing non-commodity outputs due to trade liberalization and therefore insisted that (commodity)production-linked support would be needed
  - Exporting countries
    - believed that support measures that are decoupled from commodity production (i.e., Green Box measures) would be sufficient
- ⇒ Whether agriculture is multifunctional or not has never been a policy issue!  
MF could be the policy issue only in the context of trade liberalization

WTO AGRICULTURAL AGREEMENT

- Market Access
- Domestic Support
  - Green Box: Decoupled from Commodity production
  - Blue Box: Coupled payments for crops under set-aside programs
  - Amber Box: Production and trade distorting subsidies; countries are required to reduce the amount of these subsidies in line with the commitments
- Export subsidies

TRENDS OF AGRICULTURAL POLICIES IN OECD COUNTRIES: MOVE TOWARDS MORE DECOUPLED POLICIES

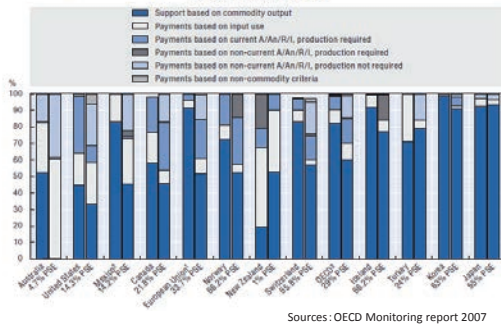
Figure 2.13. OECD: Changes in the level and composition producer support



Note: The level of support is measured by the %PSE. The composition of support is measured by the share of market price support, payments based on output and payments based on variable input use (without constraints) in gross farm receipts.  
Source: OECD, PSD/CSE database, 2007.

Many countries have been replacing price support including tariff with direct payments

Figure 2.5. Composition of Producer Support Estimate by Country, 1986-88 and 2004-06



## OECD'S WORK ON MF

- History
  - Conceptual work that lead to the analytical framework
  - Empirical studies
  - Policy implications

## WHAT IS OECD?

- 30 developed countries
- Social science based institution
- Forum for dialogue and policy coordination
  - The majority rule is not taken in making decision; e.g., any reports that have been declassified by OECD must have obtained, in principle, agreements from all member countries
  - Consensus based approach
- Sometimes, discussions at OECD influenced international negotiations
  - E.g., AMS under WTO Agreement

## AN ANALYTICAL FRAMEWORK BASED ON THE CONCEPTUAL ANALYSIS

- The conceptual analysis viewed MF from the perspective of the welfare economics theory
  - i.e., How could a country's welfare be maximized?
- The report was declassified on November 2000 and translated into French, Japanese, German, Spanish and Italian

## THE ANALYTICAL FRAMEWORK: THREE QUESTIONS

- The framework took the form of Three Questions so that policy makers without economics background could share it
- If the answers to these questions are YES, policy intervention (some types of production-linked support) could be justified

## QUESTION 1 : JOINTNESS BETWEEN COMMODITY AND NON-COMMODITY OUTPUTS

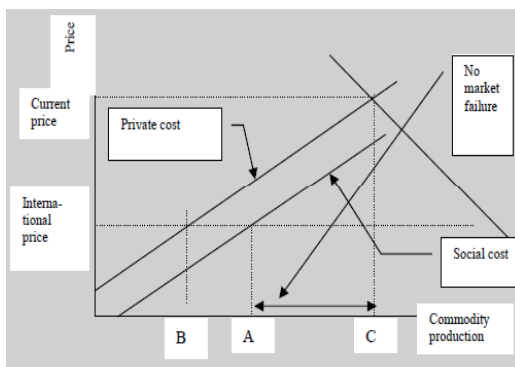
- Is there a strong degree of jointness between commodity and non-commodity outputs that can not be altered, for example, by changes in farming practices and technologies or by pursuing lower cost non-agricultural provision of non-commodity outputs?
- If the answer to this question is NO, non-commodity outputs should be supplied separately from commodity production; in this case, there should not be a complicated policy issue

## HOW COULD WE MEASURE THE DEGREE OF JOINTNESS?

- Define “delinking cost” as the cost to separate non-commodity production from commodity production
- Then, check if the following equation is satisfied  
 $\text{Production cost of a commodity output} > \text{international price of the commodity output} + \text{delinking cost}$  for all non-commodity outputs linked to the commodity output
- If it works, jointness is weak and importing food and supplying non-commodity outputs separately is more efficient than sticking to domestic production

## QUESTION 2 : MARKET FAILURES

- If so, is there some market failure associated with the non-commodity outputs?
- Even if some non-commodity outputs are lost due to trade liberalization, gains through trade may compensate those losses



## QUESTION 3 : PUBLIC GOODS CHARACTERISTICS

- If so, have non-governmental options (such as market creation or voluntary provision) been explored as the most efficient strategy?
- Even if support for farmers is required, non-governmental support measures should be explored depending on public goods characteristics of non-commodity outputs
  - E.g., green tourism

## PUBLIC GOODS CHARACTERISTICS

Table III.5. Classification of pure public goods, impure public goods and private goods (sketch)

	Non-Rival	Congestible	Rival
<b>Non-Excludable</b>	<b>Pure public goods</b> <ul style="list-style-type: none"> <li>• Landscape (non-use value)</li> <li>• Natural habitat (non-use value)</li> <li>• Biodiversity (non-use value)</li> </ul>	<b>Type II Open access resources</b> <ul style="list-style-type: none"> <li>• Food security</li> <li>• Landscape (use value by visitors)</li> </ul>	<b>Type II Open access resources</b>
<i>(Benefits involve only a small jurisdiction such as municipality)</i>	<b>Type I Local pure public goods</b> <ul style="list-style-type: none"> <li>• Flood control</li> <li>• Soil conservation</li> <li>• Land slide prevention</li> <li>• Landscape (use value by residents)</li> <li>• Cultural heritage (non-use value, region-specific)</li> <li>• Positive effects associated with rural employment</li> </ul>		
<i>(Excludable only to outsiders of a country)</i>		<b>Type III Common property resources</b> <ul style="list-style-type: none"> <li>• Groundwater recharge</li> <li>• Natural habitat (use value)</li> <li>• Biodiversity (use value)</li> </ul>	<b>Type III Common property resources</b>
<b>Excludable</b>	<b>Type IV</b> <ul style="list-style-type: none"> <li>• Natural habitat (non-use value)</li> <li>• Biodiversity (non-use value)</li> </ul>	<b>Type V Club goods</b> <ul style="list-style-type: none"> <li>• Food Security (if special arrangements were made)</li> <li>• Natural Habitat (non-use value under special conditions)</li> <li>• Biodiversity (Non-use value under special conditions)</li> </ul>	<b>Private goods</b> <ul style="list-style-type: none"> <li>• Landscape (use value by visitors if exclusion can be made)</li> <li>• Cultural heritage (use value of historical buildings)</li> <li>• Food security (use value by farmers)</li> </ul>

Source: OECD.

## IF THE ANSWERS TO THESE THREE QUESTIONS ARE YES

- Non-commodity outputs linked to commodity production would be lost due to trade liberalization of that commodity
- The loss is greater than the benefit associated with importing that commodity output
- Non governmental support is difficult
- Therefore, government’s support could be justified

**“THREE QUESTIONS”: THE BASIS FOR THE POLICY DISCUSSIONS**

- o **Jointness:** Is agriculture the most efficient provider of non-commodity outputs?
- o **Market failure:** Will reform cause decreases in welfare?
- o **Public good characteristics:** Who should pay for the provision of non-commodity outputs?

**OPERATIONALISING THE THREE QUESTIONS: BASIC PRINCIPLES**

1. Explore market mechanisms
2. The process of answering the questions itself is an important policy tool

**BENCHMARK POLICY OPTIONS**

**Jointness:**

- Weak jointness: Payments should be completely de-linked from any production activities or outputs.
- Strong jointness: Payments could be made to farmers but should be conditional on the delivery of NCOs

**Scale:**

Payments should always be geographically targeted (the only exception could be when NCOs are widespread and pure public goods)

**Public good characteristics:**

Markets; clubs; communities; governments

**DO TRANSACTION COSTS AFFECT POLICY CHOICES?**

- o In reality, TCs are a policy issue only when NCOs are widespread and pure public goods
- o The possible trade-off is targeted payments vs broad based support with cross-compliance or regulations
- o First priority is to establish if the differences in TCs are truly substantial

SO FAR, THE IMPLICIT ASSUMPTION IS THAT WE COULD ANSWER THE QUESTIONS AND DECIDE THE BEST POLICY TO MAXIMIZE EFFICIENCY; IN REALITY, THIS ASSUMPTION MAY NOT WORK, TO WHICH WE NEED TO FIND SOLUTIONS

**Demand measurement**  
as much as possible

**Decentralizing decision making**  
⇒

**Farmers' responses to price decreases**  
approaches with systematic monitoring

**Gradual**  
⇒

**SEQUENCING IS ALSO IMPORTANT TO ADDRESS ISSUES ASSOCIATED WITH UNCERTAINTIES**

- o Internalize negative externalities
- o Facilitate structural adjustments
- o Try market mechanisms to determine economies of scope and to reveal demand
- o Establish institutional arrangements to encourage club and voluntary provision
  - E.g., Agriculture in emission trading markets
- o Decentralize decision making process

THERE ARE TWO TYPES OF GHG EMISSION TRADING SCHEME

- Cap & Trade only
  - Trade could be allowed only among regulated companies (exception is CDM)
  - EU-ETS
- Cap & Trade with offset projects
  - Trade could be allowed among regulated companies and offset providers that are not regulated
  - Other than EU-ETS

Scheme	Is CAP applied to agriculture?	Are there any offset projects?	Are there any agricultural offset projects?
EU-ETS	x	x	x
NSW	x	○	△ (Forestry)
CCX	x	○	○
RGGI	x	○	○
US Federal	x	○	○
Australia	x	○	?
WCI	x	○	○
California	x	○	?

EFFICIENCY COULD NOT BE THE ONLY POLICY OBJECTIVE:  
HOW DO NON-EFFICIENCY CONCERNS AFFECT POLICY CHOICES?

- Equity (income distribution)
  - Regional income distribution
  - Mismatch between beneficiaries and those who pay
- Policy stability
- International spill-over

FURTHER THOUGHTS: MF AS A “WICKED” PROBLEM

- I learnt a lot from the presentation by Professor Sandra Batie of Michigan State University, “**Societal Concerns as Wicked Problems**” prepared for the OECD’s workshop on **the Economic and Trade Implications of Policy Responses to Societal Concerns**  
([http://www.oecd.org/document/8/0,3343,en\\_2649\\_33773\\_4\\_3549128\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/8/0,3343,en_2649_33773_4_3549128_1_1_1_1,00.html))
- Professor Batie described those problems with high degree of value conflicts among stakeholders and high degree of uncertainties as wicked problems; and she argued that the role of science in solving wicked problems would be very much different from the other types of problems