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**BENEFITS, OPPORTUNITIES, COST AND RISK IN  
DELIVERING PUBLIC GOODS IN AGRICULTURE:  
SOUTH CENTRAL PLANNING REGION IN BULGARIA  
CASE STUDY**

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# 1. Introduction

Agriculture is substantial part of the economic activity in the South Central Region, Bulgaria which half territory is used for agricultural production.

- ✓ The main result of this activity is production of raw materials for the processing industry products and foods.
- ✓ The secondary effects are impact on the environment and landscape formation. This impact could be positive or negative.
- ✓ On the other hand, the agriculture create attractive landscapes and to preserve the local culture and traditions. Thus, the agriculture insures public goods, which bring social and ecological benefits.

# The hotspot: **West Rhodope Mountain**



## **1. Introduction**

CAP focuses on issues like economic sustainability in agriculture, determining convenient monetary values associated with specific public goods on both demand and supply side.

This research focuses on implementation of the most relevant methods concerning demand-side valuation assessments of public goods/bads (PGBs) provided by agricultural and forestry systems (AFS) with the scope of achieving comparable monetary values for distinct degrees of improvements.

## **2. Research method**

The necessary data is collected through the leading of focus group with deep examination of the analyzed thematic scope, using the advantages of the group dynamics and impact.

During the discussions, through detailed analysis of pre-defined circle of questions, have been formulated clear categories and definitions, which helped the better explication and understanding of the phenomena qualitative researches.

The participants were 14 persons – farmers, representatives of agricultural associations, local public bodies and advisors. The participants were divided in two groups of 7 persons. Every group has received natural-geographic map of the region and list of 10 potential public goods. Each participant has had a task to identify the location of public goods in the region using 3 colors of adhesive stickers (red = available; white = neutral; blue = lack).

## **2. Research method**

Following previous studies on combining contingent valuation and the analytical hierarchy process, benefits, opportunities cost and risks are structured in a complex Analytical Network (ANP) Model.

In the model the control hierarchy is providing overriding criteria for comparing each type of interaction that is intended by the network representation of the demand for public goods in agriculture in the South central planning region in Bulgaria.

### 3. Results

#### List of public goods and bads provided by agriculture and forestry

<b>Public goods and bads</b>	<b>Agriculture</b>	<b>Forestry</b>
Public Goods	Landscape	Air Quality
	Water availability	Water Quality
	Food Security	Climate change mitigation
	Rural vitality	Rural vitality
	Biodiversity	Resilience to Fire
	Soil functionality	
Public Bads	Pollination	Pollination



### 3.Results

#### Trends of public goods development in the region

<b>Public goods and bads</b>	<b>Increase</b>	<b>Stable</b>	<b>Under decline</b>
Air Quality		X	
Water Quality		X	
Climate change mitigation			X
Soil functionality			X
Pollination	X		
Landscape	X		
Rural vitality			X
Biodiversity			X
Food Security	X		
Resilience to Fire			X
Water availability		X	

### 3. Results

#### Rank of public goods in the region

<b>Public goods and bads</b>	<b>Rank</b>
Climate change mitigation	4
Water Quality	4
Air Quality	4
Rural vitality	4
Soil functionality	2
Landscape	2
Biodiversity	2
Food Security	2
Pollination -	1
Water availability	1
Resilience to Fire	1

# 3. Results

## CLUSTERS OF INFLUENCE IN THE DETERMINATION (DEMAND/SUPPLY ) OF THE (SELECTED)PUBLIC GOODS

### ALTERNATIVE DECISIONS

- A1. WATER QUALITY
- A2. FOOD SECURITY
- A3. SCENERY AND RECREATION

**STAKEHOLDERS** (include people or groups that will be impacted by the alternative decisions regarding the provision of public goods)

- S1. RURAL POPULATION IN THE AREA
- S2. POTENTIAL TOURIST IN THE AREA ( WATER TOURISM, SPA TOURISM)
- S3. COOPERATIVES (MARKETING-LABELING OF THE LOCAL PRODUCTS)
- S4. LOCAL AUTHORITIES (MUNICIPALITY, AGRICULTURAL DIRECTORATE)

**COST OF RESOURCES** (refer to those costs that may be incurred when choosing the alternative decisions)

- C1. IRRIGATION COSTS
- C2. SOIL DEGRADATION
- C3. SKILLED WORKFORCE (including knowledge of fulfilling standards for landscape preservation imposed by subsidies, unemployment )

### **3. Results**

#### **CLUSTERS OF INFLUENCE IN THE DETERMINATION (DEMAND/SUPPLY ) OF THE (SELECTED)PUBLIC GOODS –CONT'D RESOURCES**

- R1. WATER (irrigation, fishery and aquaculture, spa tourism, production of water electricity)
- R2. LAND (crop rotation)
- R3.WORKERS
- R4. ROAD (infrastructure and maintance)

**PUBLIC RELATION** (this cluster considers elements that will impact in the governance's relationship with the stakeholders)

- P1.SUBSIDIES (subsidies for maintaining the landscape, costs for protection the landscape)
- P.2. ECO-ROAD (improving access to nature-eco-road )

**LANDSCAPE PRESERVATION** (Multi-functionality of agriculture)

- L1. WATER QUALITY
- L2. AIR QUALITY
- L3. BIO-DIVERSITY
- L4. HIGH NATURAL VALUE LAND

### **3. Results**

#### **CLUSTERS OF INFLUENCE IN THE DETERMINATION (DEMAND/SUPPLY ) OF THE (SELECTED)PUBLIC GOODS –CONT'D**

##### **FOOD SECURITY (Multifunctionality of agriculture)**

F1. ECO-STANDARDS

F2. CROP ROTATION

F3. FOOD CLUSTERS

F4. DISEASES AND PESTS IN THE VIOLATION OF THE FOOD SECURITY

##### **EFFECTS OF GLOBAL WARMING**

E1. EROSION

E2. FLOODING

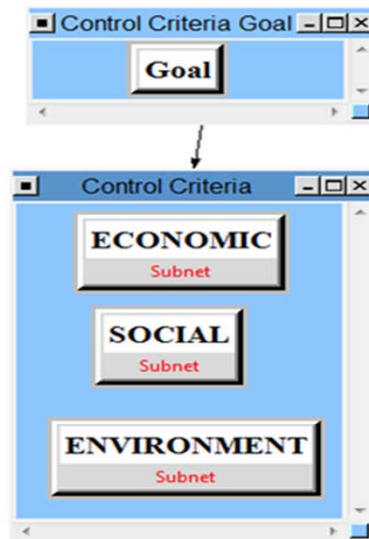
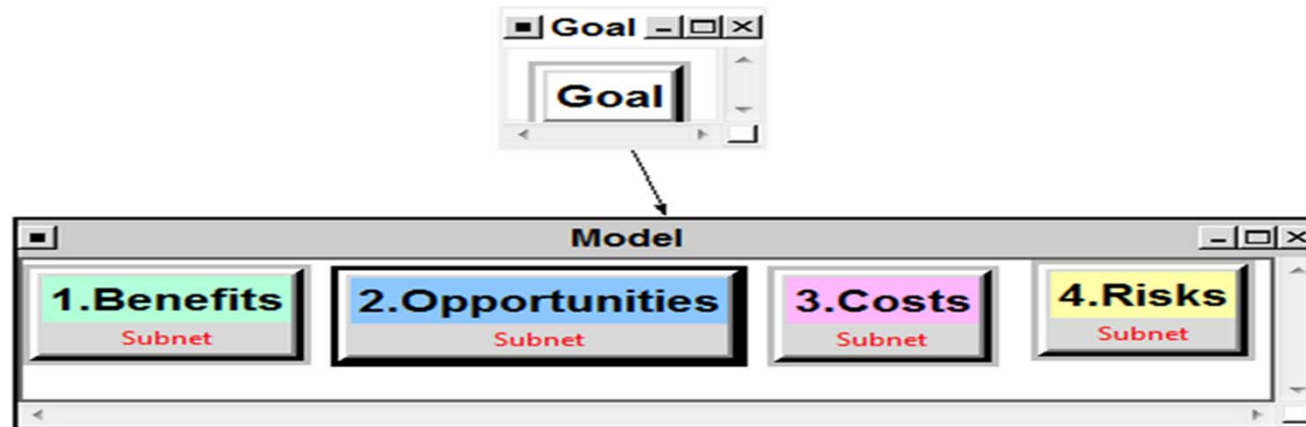
E3. SWAMPING

### 3. Results

#### DISTRIBUTION OF THE NODES ACCORDING TO BOCR, STRATEGIC CRITERIA AND PUBLIC GOODS

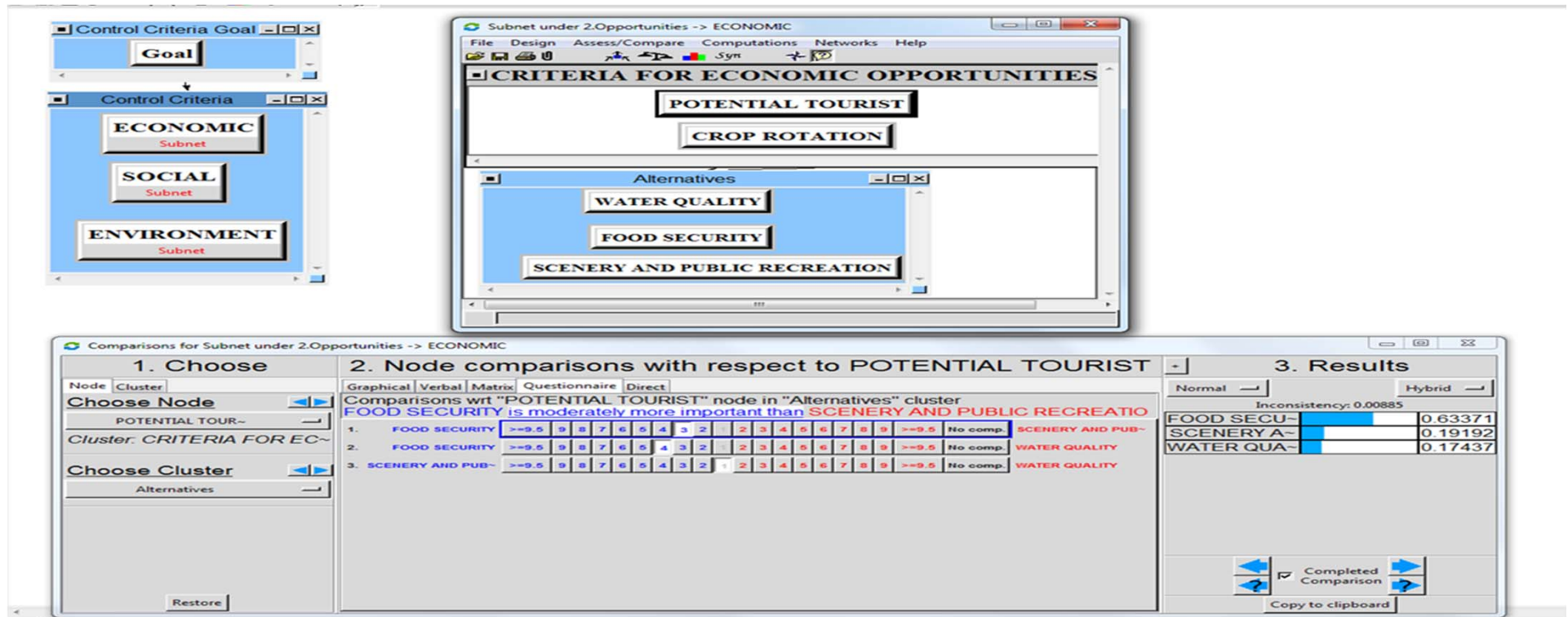
<i>Elements</i>		<i>Water quality</i>	<i>Food security</i>	<i>Scenery and recreation</i>
<b>Benefits</b>	<b>Social</b>	<b>RURAL POPULATION</b>	<b>COOPERATIVES</b>	<b>POTENTIAL TOURIST</b>
	<b>Economic</b>	<b>RURAL POPULATION IN THE HOTSPOT AREA</b>	<b>FOOD CLUSTERS</b>	<b>RURAL POPULATION IN THE HOTSPOT AREA</b>
	<b>Environment</b>	<b>LOCAL AUTHORITIES</b>	<b>COOPERATIVES</b>	<b>POTENTIAL TOURIST</b>
<b>Opportunities</b>	<b>Social</b>	<b>SUBSIDIES</b>	<b>SUBSIDIES</b>	<b>ECO-ROAD</b>
	<b>Economic</b>	<b>POTENTIAL TOURIST</b>	<b>CROP ROTATION</b>	<b>POTENTIAL TOURIST</b>
	<b>Environment</b>	<b>Water</b>	<b>ECO-STANDARDS</b>	<b>HIGH NATURAL VALUE LAND</b>
<b>Costs</b>	<b>Social</b>	<b>SUBSIDIES</b>	<b>SUBSIDIES</b>	<b>SUBSIDIES</b>
	<b>Economic</b>	<b>WATER</b>	<b>ECO-STANDARDS</b>	<b>LAND</b>
	<b>Environment</b>	<b>IRIGATION COSTS</b>	<b>ECO-STANDARDS</b>	<b>SOIL DERGADATION</b>
<b>Risk</b>	<b>Social</b>	<b>SKILLED WORKFORCE</b>	<b>DISEASES AND PESTS</b>	<b>AIR-QUALITY</b>
	<b>Economic</b>	<b>FLOODING</b>	<b>SKILLED WORKFORCE</b>	<b>SOIL EROSION</b>
	<b>Environment</b>	<b>BIO-DIVERSITY</b>	<b>DISEASES AND PESTS</b>	<b>ROAD (INFRASTRUCTURE AND MAINTANCE )</b>

# 3. Results THE BOCR – ANP Model



# 3. Results

## Pairwise comparison-Survey



**EVALUATION OF THE PRIORITY VECTOR OF THE ALTERNATIVES UNDER THE ECONOMIC OPPORTUNITIES**

When you think of the **ECONOMIC OPPORTUNITIES** of POTENTIAL TOURIST what is more important?

Water quality or Food security

9	8	7	6	5	4	3	2	1	2	x	4	5	6	7	8	9
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Food security or Scenery and recreation

9	8	7	6	5	x	3	2	1	2	3	4	5	6	7	8	9
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Scenery and recreation or Water quality

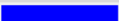
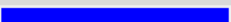

9	8	7	6	5	4	3	2	x	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



### 3. Results

# Synthesis

Here are the overall synthesized priorities for the alternatives. You synthesized from the network Super Decisions Main Window: BOCR\_POLAND.sdmod: formulaic

Name	Graphic	Ideals	Normals	Raw
FOOD SECURITY		0.510143	0.266094	0.191552
SCENERY AND PUBLIC RECREATION		1.000000	0.521606	0.375488
WATER QUALITY		0.407014	0.212301	0.152829

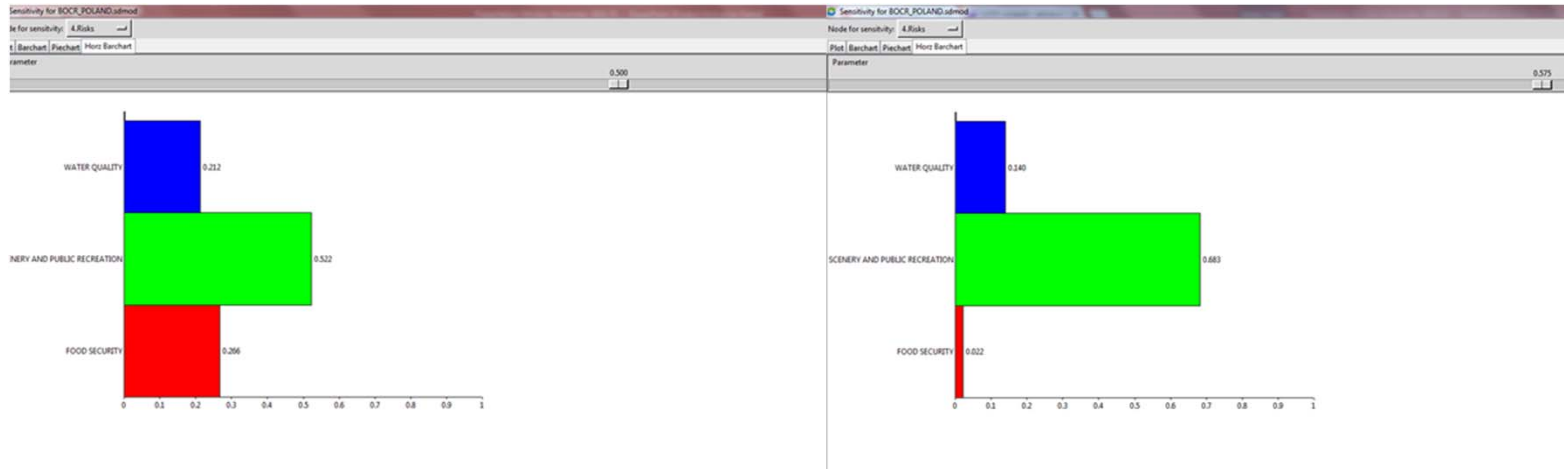
FOOD SECURITY                      0.510143      0.266094

SCENERY AND PUBLIC RECREATION    1.000000      0.521606

WATER QUALITY                      0.407014      0.212301

# 3. Results

## Risk Sensitivity Analysis



CONTROL PARAMETER FOR THE IMPORTANCE OF THE RISK CLUSTER				RATE OF CHANGE		
				<b>0.5</b>	<b>0.575</b>	<b>0.15</b>
				<b>0.064</b>		
<b>WATER QUALITY</b>				<b>0.212</b>	<b>0.14</b>	<b>-0.34</b>
<b>SCENERY AND PUBLIC RECREATION</b>				<b>0.522</b>	<b>0.683</b>	<b>0.308</b>
<b>FOOD SECURITY</b>				<b>0.266</b>	<b>0.022</b>	<b>-0.917</b>
<b>Inconsis</b>	<b>0.071</b>					
<b>Name</b>		<b>Normalized</b>	<b>Idealized</b>			
<b>1.Benefits</b>		<b>0.527</b>	<b>1</b>			
<b>2.Opportunities</b>		<b>0.131</b>	<b>0.248</b>			
<b>3.Costs</b>		<b>0.279</b>	<b>0.529</b>			
<b>4.Risks</b>		<b>0.064</b>	<b>0.122</b>			

## 4. Conclusions

On the base of the achieved research the following main conclusions for the creation and development of public goods in South Central Region, Bulgaria.

- ✓The region is rich of public goods and this way it has national importance.
- ✓The agriculture and the forestry have a key role for public goods formation.
- ✓The implementation of intensive production practices creates premises for negative trends for public goods development.
- ✓The mountain agriculture has been identified as more attractive from the point of view of the potential consumer.
- ✓The potential of available public goods has not been used in a sufficient degree to guaranty the rural areas viability in the Rhodope Mountain and to stimulate their development.

## 4. Conclusions

In the context of the weighted importance of strategic criteria (economic, social, environment) the public good referred as "scenery and public recreation" has the highest synthesised weight of importance (0.5 in comparisons with 0.26 for food security and 0.21 for water quality). This shows that this public good is most visible.

When risk perception is increasing it's appeared scenery and public recreation and food security is most adverse affective.

Within the led discussion it has been established that the conception for the public goods is not popular among Bulgarian society.

It is necessary to elaborate a strategy for promotion of public goods advantages and in the same time, to implement a policy for preservation and development of public goods.

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**Thank you for your attention!**