Valuing Ecosystem Services and Biodiversity: Experience and Approaches Taken in Georgia

Workshop for Eastern Europe and Central Asia on Valuation and Incentive Measures

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Valuing Ecosystem Services and Biodiversity: Experience and Approaches Taken in Georgia

Part 1: Economic valuation studies undertaken in Georgia and used approaches

Part 2: Basics of Sector Scenario Analysis (SSA)

Part 3: Results of recent UNDP/GEF and WWF economic valuation studies:

Economic Valuation of the Contribution of PA Ecosystem Services to Economic Growth and Peoples' Wellbeing in Georgia

Part 1: Economic Valuation Studies Undertaken in Georgia and Used Approaches

- World Bank studies (2000) exploring the revenue generation potential of the national parks to be established under the GEF funded Protected Areas Development Project:

  - *Contingent Valuation Survey among Georgian City Dwellers: Attitudes, Preferences and Willingness to Pay for Biodiversity Conservation.* Tijen Arin, World Bank. Manon Circe, Tecsult Inc. Georgian Opinion Research Business International (GORBI). (2000);

  - *Tourist Preferences for the Establishment of National Parks in Georgia, Survey Results for Expatriates Residing in Tbilisi, Georgia.* Tecsult International Inc. (2000).

- Methodology used – **Contingent Valuation Method:** the respondents were asked for their maximum willingness to pay (WTP) for access to national parks (e.g. the highest entrance fee that they would pay) as well as WTP for nature conservation in Georgia.

Part 1: Economic Valuation Studies Undertaken in Georgia and Used Approaches

Some findings of these studies:

- ***Contingent Valuation Survey among Georgian City Dwellers (2000):***

  - The recreational value that Georgian city dwellers would derive from visiting national parks was estimated at 2.7 million GEL (1.7 mln USD) annually.

  - 1.1 million GEL of this value could be captured by the national parks through the introduction of an annual pass at 5 GEL (3 USD) per adult person;

  - Urban residents of the five urban areas surveyed would derive an estimated 3.5 million GEL (2.15 mln USD) annually in non-use value from improved biodiversity protection.

- ***Survey Results for Expatriates Residing in Tbilisi (2000):***

  The average willingness to pay among expatriates for entering a Georgian National Park was 21.5 GEL (13.2 USD).

Part 1: Economic Valuation Studies Undertaken in Georgia and Used Approaches

- In 2000-2001 the WB conducted a study Benefits and Costs of Establishing the Kolkheti National Park in the Kolkheti wetlands

- Total Economic Valuation (TEV) methodology was applied in estimating the costs and benefits associated with the establishment of the national park.

- This approach accounts for all uses and services of ecosystems and biodiversity that humans derive from them.

Table 1: Classification of total economic value for Kolkheti National Park

Use Values			Non-Use Values
Direct Use Values	**Indirect Use values**	**Option Value**	**Existence value**
Crop cultivation	Nutrient retention	Potential future uses	Biodiversity
Grazing	Carbon Sequestration		Archeological treasure
Fuelwood collection	Flood control		Culture, heritage
Hunting	Water filtering		Bequest (preservation for future generations)
Fishing	Micro-climatic stabilization		
Recreational and tourism (eco- and cultural)	Spawning grounds		
Peat harvesting	Groundwater regulation and protection		
Scientific research	Habitats for migratory birds		
Education			
Esthetic value			

Part 1: Economic Valuation Studies Undertaken in Georgia and Used Approaches

• The cost-benefit analysis found that the establishment of the KNP under the current KPA Law would lead to significant net losses to the local communities. A socially and ecologically sustainable alternative was needed.

• Study results suggested that in this alternative scenario, limitations on resource use in the KNP should have been less strict but within the limits of ecological sustainability.

• Based on the findings of this analysis some specific recommendations were presented to guide the preparation of the KNP Management Plan.

Part 1: Economic Valuation Studies Undertaken in Georgia and Used Approaches

• Georgian Forest Development Project (World Bank):

- *Legal, Institutional and Economic Background of Georgia's Forest Sector and Principles of Total Economic Valuation*. Report 1. URS Corporation Ltd (2003);

- *Legal, Institutional and Economic Analysis, Forest resource Evaluation Methodology, Resource Pricing Mechanisms ad worked Example of Forest Resources Economic Valuation for Oni Forest District for Forest Management Planning and Valuation Purposes in Georgia.* Report 2. URS Corporation Ltd (2003);

• 2010: UNDP/GEF project Catalyzing the Financial Sustainability of Georgian Protected Areas System: Economic Valuation of the Tusheti National Park and of the Network of Georgian Protected Areas.

• 2011: WWF Caucasus Programme Office: *Valuation of the Contribution of Borjomi-Kharagauli and Mtirala National Parks Ecosystem Services to Economic Growth and Human Well-being.* The study results presented on a regional workshop in March 2012.

Part 1: Economic Valuation Studies Undertaken in Georgia and Used Approaches

- Based on the Tusheti NP (UNDP/GEF) and WWF valuation studies a draft report *Economic Valuation of the Contribution of Ecosystems to Economic Growth and Human Well-Being in Georgia: Protected Areas of Tusheti and the Georgian Network of Protected Areas* was developed in 2012. Final report is expected to be submitted in June 2012.

- Both UNDP/GEF and WWF economic valuation studies were undertaken by the same group of international and national experts;

- UNDP/GEF report builds upon and integrates the findings and results of the WWF report. Both studies applied the same methodology - Sector Scenario Analysis: Business as Usual (BAU) and Sustainable Ecosystems Management (SEM).

Part 1: Economic Valuation Studies Undertaken in Georgia and Used Approaches

- 2011: Georgian President Mr. Mikheil Saakashvili expressed interest with WWF and UNEP for Georgia to become a pilot country for the national assessment work of TEEB

- UNEP is in the process of developing a fully-fledged proposal for Georgia and seeking donors to assist in carrying out a TEEB Georgia study

- UNEP launched a first scoping study to identify existing valuation studies carried out for Georgia as well as opportunities to build on these studies

End of Part 1.

Part 2: Basics of Sector Scenario Analysis

Ecosystem services:

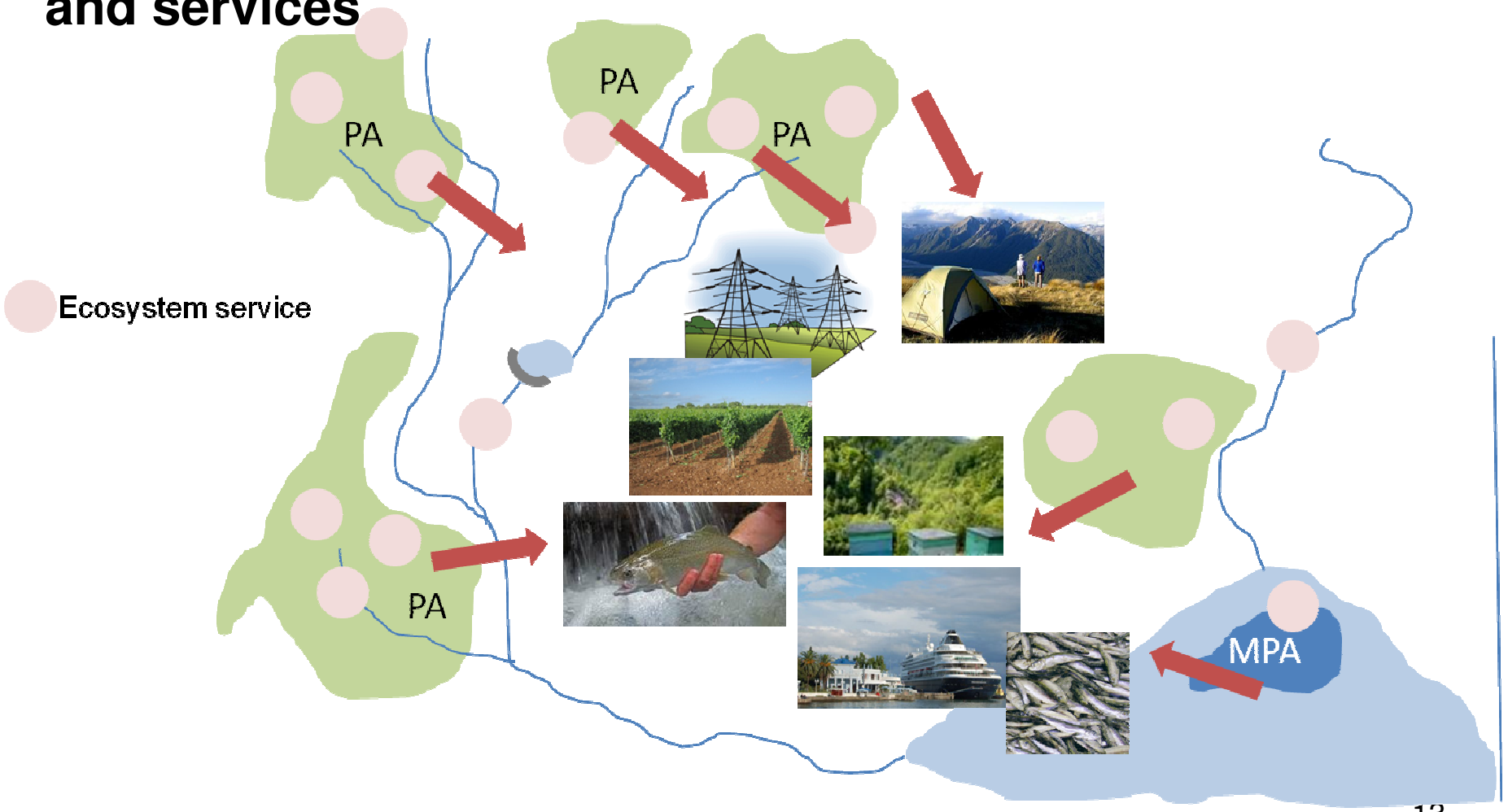
- Ecosystem services (ES) are the conversion of natural assets – such as trees, snow cover, and soil fertility – into valuable benefits such as wood products, winter tourism, fresh water and arable land (Schroter et al., 2005):

- **Freshwater (watershed services)**
- **Food (Wild meets, fruits, greens, fresh water fish and seafood)**
- **Timber, fire wood**
- **Biodiversity regulation/conservation (habitat for plant/animal species)**
- **Wild crop varieties**
- **Nutrient cycling**
- **Snow coverage**
- **Air quality and carbon sequestration**
- **Human health**
- **Detoxification**
- **Natural hazard regulation**
- **Nature based sports: fishing, hunting, skiing, hiking, nature & wildlife viewing**

- Protected areas provide the best continuous natural conditions for ecosystems to be able to function and continue to deliver these services.

Part 2: Basics of Sector Scenario Analysis

Ecosystems generate many economically valuable goods and services



Part 2: Basics of Sector Scenario Analysis

Sector Scenario Analysis using BAU and SEM scenarios

- Identify linkages between ES and economic sectors
- Assess the level of ecosystem service input to economic sectors
- Identify the potential changes in sector-productivity under different management strategies: Busyness as Usual (BAU) and Sustainable Ecosystems Management (SEM)
- Develop scenarios under short (4year, political), medium (4-20yrs) and/or longer (20-50 year) time frames
- Assess the resulting change in sectors' production
- Assess changes in terms of various socio-economic indicators e.g. employment, return on investment, poverty, etc.

Part 2: Basics of Sector Scenario Analysis

Comparing BAU/SEM scenarios

BAU

Business **A**s **U**sual

how ecosystem degradation lowers outputs and results in costs and losses

SEM

Sustainable **E**cosystem **M**anagement

how sustainable ecosystem management practices generate benefits and reduce costs

Part 2: Basics of Sector Scenario Analysis

Indicators to estimate net benefits of SEM compared to BAU:

- production (volume, value)
- employment (direct, indirect and induced)
- income
- fiscal impacts (tax revenues, subsidies and green taxes)
- foreign exchange (foreign investments, exports)
- avoided damage costs
- returns on investment
- net revenue
- productivity (return to labor, land, capital)
- changes in natural capital
- equity impact on the poor / distribution of benefits

Part 2: Basics of Sector Scenario Analysis

Selecting sectors and indicators for BAU / SEM

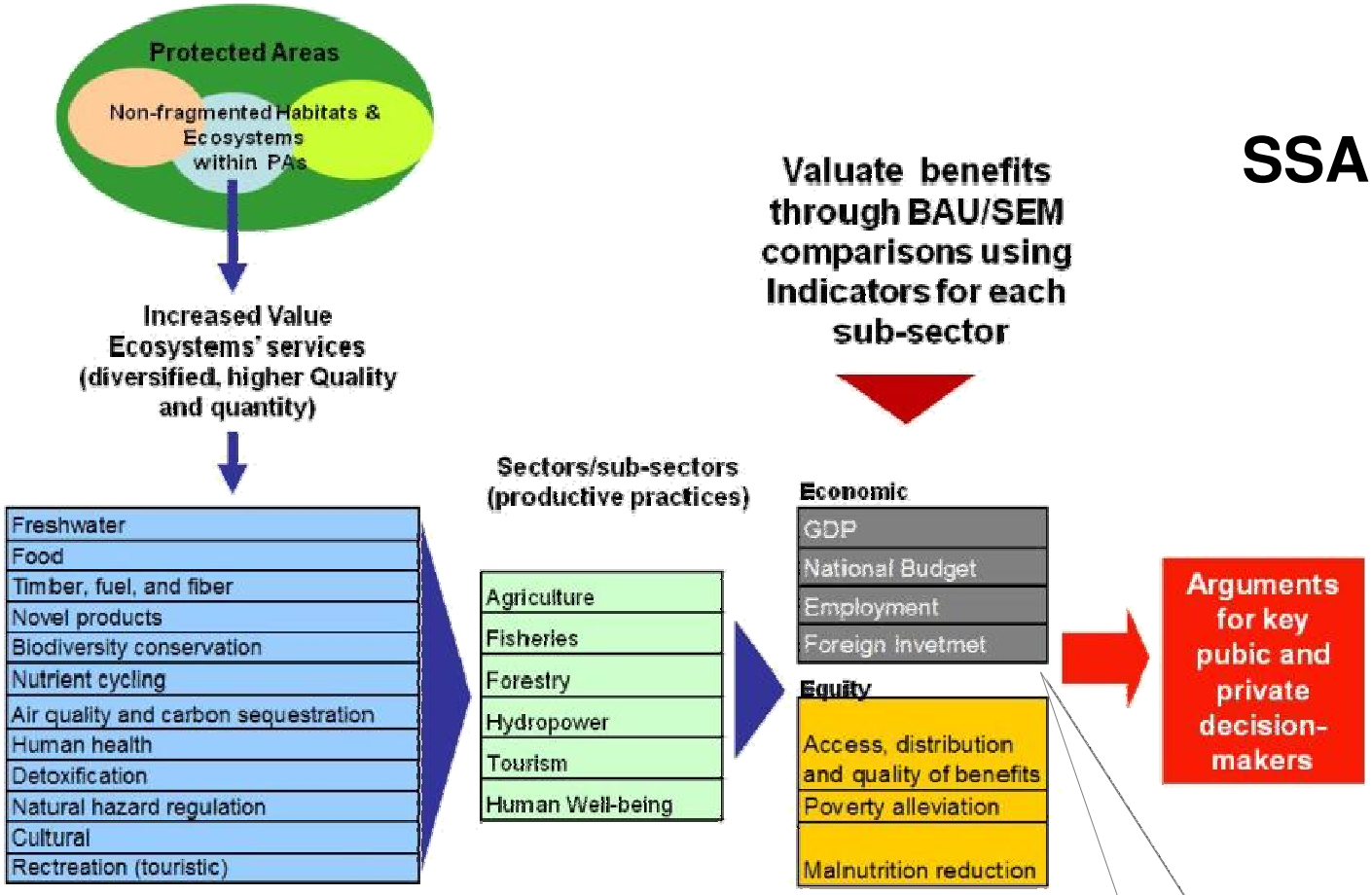
Indicator	Productive sectors							Well-being			Comparison	
	Forestry	Agriculture	Fisheries	Hydropower	Beverages industry	Wine industry	Tourism	Natural disaster mitigation	Water supply coverage	Rural livelihoods	BAU	SEM
Employment (direct, indirect and induced)	?	?	?	?	?	?	?				?	?
Income trends	?	?	?	?	?	?	?			?	?	?
Fiscal impacts (tax revenues, subsidies and green taxes)	?	?	?	?	?	?	?				?	?
Foreign exchange (foreign investments, exports)	?	?	?	?	?	?	?				?	?
Access to green markets/income & innovation potential	?	?	?	?	?	?	?			?	?	?
Opinion polls /surveys	?	?	?	?	?	?	?	?	?	?	?	?
Avoided damage costs								?			?	?
Returns on investment	?	?	?	?	?	?	?	?	?	?	?	?
Production (volume, value)	?	?	?	?	?	?	?	?	?	?	?	?
Net revenue	?	?	?	?	?	?	?		?	?	?	?
Changes in natural capital	?	?	?	?	?	?	?				?	?
Equity impact on the poor / distribution of benefits									?	?	?	?

Part 2: Basics of Sector Scenario Analysis

Use of SSA information (values)

- Provide evidence of ecosystems' contribution to the economy
- Inform policy makers and businesses of risks and opportunities of production that depends and impact on biodiversity and ecosystem services
- Assist government and stakeholders in integrating ecosystem values into policy, planning and investment
- Assess economic returns to financing sustainable ecosystems management
- Show economic and development rationale to sustainable ecosystem management

SSA FLOW



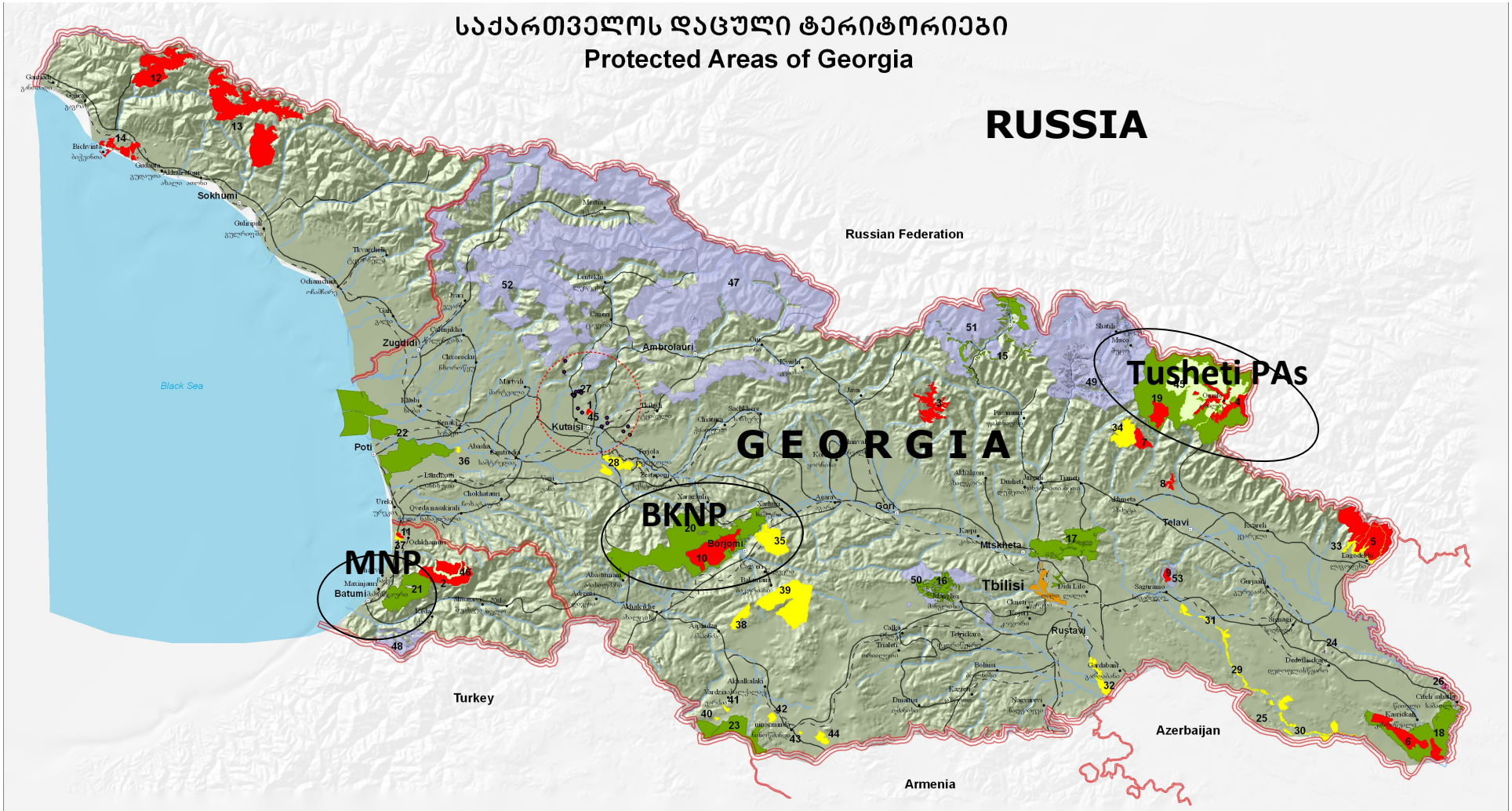
- employment
- income trends
- fiscal impacts (tax revenues, subsidies and green taxes)
- foreign exchange (foreign investments, exports)
- access to green markets/income & innovation
- opinion polls /surveys
- avoided damage costs
- returns on investment
- production (volume, value)
- net revenue
- productivity (return to labor, land, capital)
- changes in natural capital
- equity impact on the poor / distribution of benefits

End of Part 2

Part 3: Economic Valuation of the Contribution of PA Ecosystems to Economic Growth and Human Wellbeing in Georgia

This economic valuation has been based on the UNDP/GEF and WWF studies of 3 selected PAs in Georgia – Tusheti PAs, Borjomi-Kharagauli and Mtirala National Parks.

საქართველოს დაცული ტერიტორიები
Protected Areas of Georgia



სახელმწიფო ნაკრძალი Nature Reserve		ეროვნული პარკი National Park		ბუნების ძეგლი Natural Monument	აკკეთილი Managed Reserve		დაცული ლანდშაფტი Protected Landscape		გეგმარებითი დაცული ტერიტორიები Planned Proteced Areas
1. სათაფლიას სნ	1. Sataplia NR	15. ყაზბეგის ეპ	15.Kazbegi NP	24. არწივის ხეობის ბძ	29. იორის აკ	28. Ajameti MR	45. თუშეთის დლ		47. ცენტრალური კავკასიონის გეტ
2. კინტრიშის სნ	2. Kintrishi NR	16. ალგეთის ეპ	16. Ajameti NP	25. ტახტი-თეფას ბძ	30. ჭაჭუნას აკ	29. Iori MR	46. კინტრიშის დლ		48. მაჭახელას გეტ
3. ლიახვის სნ	3. Liakhvi NR	17. თბილისის ეპ	17. Tbilisi NP	26. ალაზნის ჭალის ბძ	31. ყორულის აკ	30.Chachuna MR			49. ხევსურეთის გეტ
4. თუშეთის სნ	4. Tusheti NR	18. ვაშლოვანის ეპ	18. Vashlovani NP	27. იმერეთის მღვიმეთა ბძ	32. გარდაბნის აკ	31. Korugi MR			50. თრიალეთის გეტ
5. ლაგოდეხის სნ	5. Lagodekhi NR	19. თუშეთის ეპ	19. Tusheti NP		33. ლაგოდეხის აკ	32. Gardabani MR			51. ყაზბეგის ეროვნული პარკის გაფართოება
6. ვაშლოვანის სნ	6. Vashlovani NR	20. ბორჯომ-ხარაგაულის ეპ	20. borjomi-Kharagauli NP		34. ილტოს აკ	33. Lagodekhi MR			52. სამეგრელოს გეტ
7. ბაწარას სნ	7. Batsara NR	21. მტირალას ეპ	21. Mtirala NP		35. ნეძვის აკ	34. Ilto MR			53. მარიამჯვარის ნაკრძალის გაფართოება
8. ბაბანეურის სნ	8. Babaneuri NR	22. კოლხეთის ეპ	22. Kolkheti NP		36. კაცობურის აკ	35. Nedzvi MR			**47. Central Caucasus PPA**
9. მარიამჯვარის სნ	9. Mariamjvari NR	23, ჯავახეთის ეპ	23. Javakheti NP		37. ქობულეთის აკ	36. Katsoburi MR			**48. Machakhela PPA**
10. ბორჯომის სნ	10. Borjomi NR				38. თეთრობის აკ	37. Kobuleti MR			**49. Khevsureti PPA**
11. ქობულეთის სნ	11. Kobuleti NR				39. ქცია-ტაბაწყურის აკ	38. Tetrobi MR			**50. Trialeti PPA**
12. რიწის სნ	12. Ritsa NR				40. კარწახის აკ	39. Ktsia-Tabatskuri MR			**51. Khazbegi NP Widen**
13. ფსხუ-გუმისთის სნ	13. Pskhu-Gumista NR				41. სულდის აკ	40. kartsakhi MR			**52. Samegrelo PPA**
14. პიცუნდა-მიუსერას სნ	14. Pitsunda-Miusera NR				42. ხანჩალის აკ	41. Sulda MR			**53. Mariamjvari NR Widen**
					43. ბუღდაშენის აკ	42. Khanchali MR			
					44. მადატაფას აკ	43. Bughdasheni MR			
					44. სათაფლიას აკ	44. Madatapha MR			

Part 3. Economic valuation of the contribution of PA ecosystem services to economic growth and human wellbeing in Georgia

• The studies were undertaken in 2010-2012 by Mr. Marlon Flores from the Ecologic Institute (Washington D.C.), Malkhaz Adeishvili (Georgian National Expert) and a group of local experts.

• Objective was not to assess total economic value of all PAs;

• The objective was to illustrate on the example of selected PAs the contribution of ES to the economic development and human wellbeing

Part 3. Economic valuation of the contribution of PA ecosystem services to economic growth and human wellbeing in Georgia

- SSA analysis BAU and SEM methodology

- Information sources:
  - PA Management Plans
  - Socio-Economic studies of WB (2005), NACRES/FFI (2009), NACRES (2010)
  - Field Visit to PAs (August 2010, July 2011)
  - Local experts' information
  - Statistical data of the Georgian Statistical service

- Limitations:
- Lack of scientific information on ecosystem services and links with economic sectors in Georgia
- Lack of economic sector level data by time series.

Part 3. Economic valuation of the contribution of PA ecosystem services to economic growth and human wellbeing in Georgia

Findings of the economic valuation of the PA network's contribution to economic development:

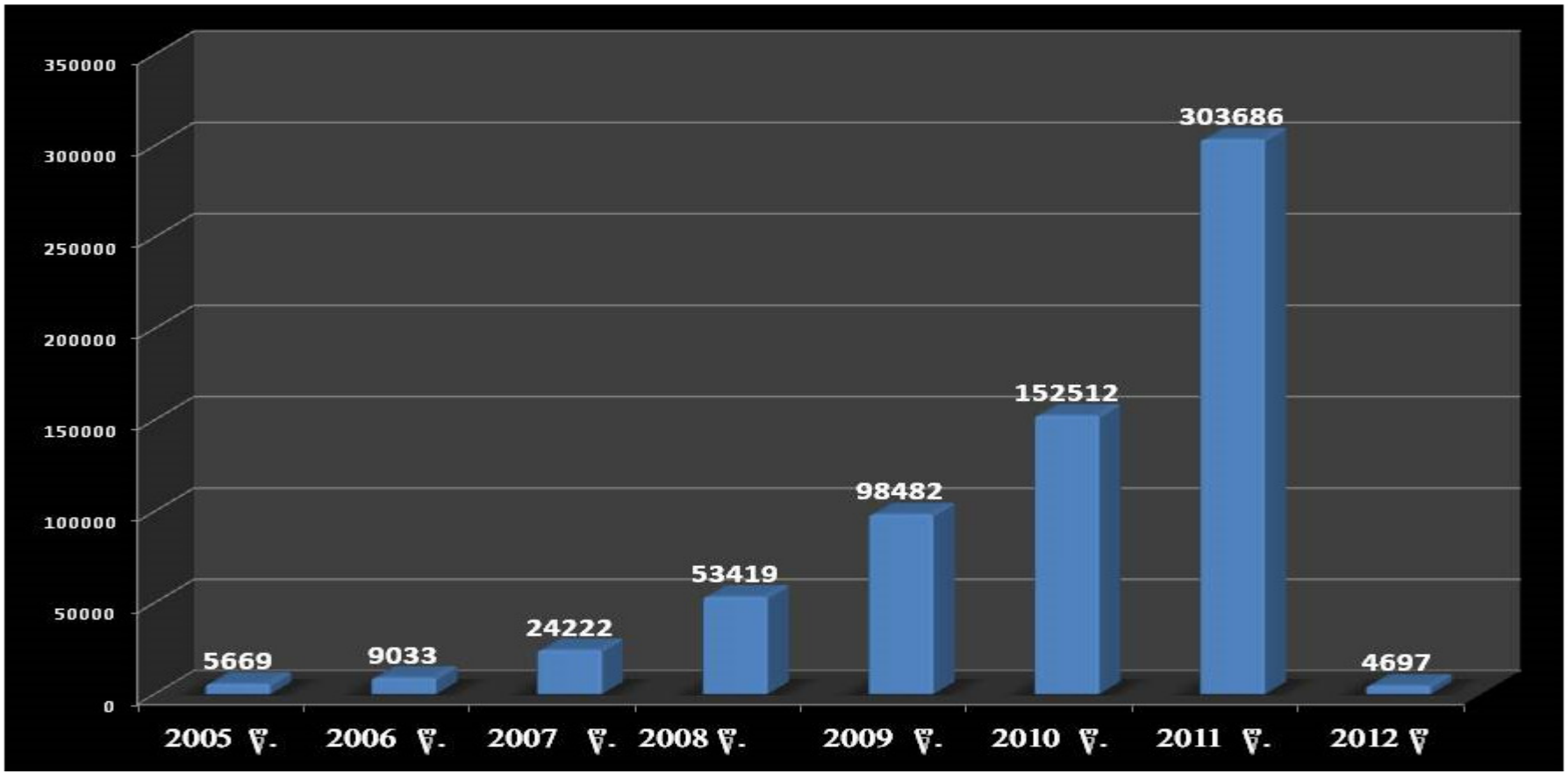
- ES of PAs contribute significantly to economic development, poverty reduction and wellbeing of population in Georgia

- ES contribute to the development of economic sectors such as:
  - Tourism
  - Agriculture
  - Hydropower
  - Fishery
  - Fresh water supply
  - Mineral and bottled water

- Input of ES into production processes in Georgia are abundant and essentially free.

Contribution of the PAs to Tourism

- Tourism and NB tourism are rapidly growing sectors in Georgia
- Number of visitors to Georgian PAs (2005-2011)



Contribution of the PAs network to tourism

• No statistical data is available on the contribution of the NB tourism to economic growth (GDP) in Georgia

• The average expenditure of a tourist visiting Georgia - USD 1,732

• Assuming 30% are foreign tourists – total expenditures of the tourists in Georgia would be 155 mln USD

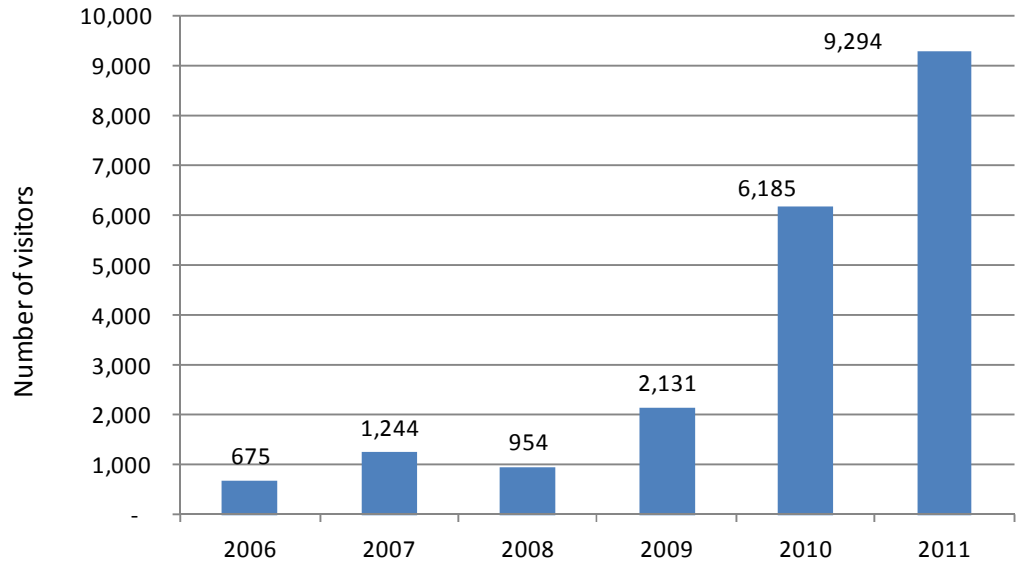
• Borjomi-Kharagauli NP and related ecosystems are good examples of promoting tourism, recreation, health and sports around PAs

• Hotels' economic turnover is one of the highest in the region where the BKNP is located.

Nature based tourism in TPA

- Tourism is growing in TPA

Figure 11. Vistation to Tusheti protected areas (2006-2011)



Source: Administration of the TPAs (2010)

Source: Consultant

Nature based tourism in TPA

- Local people are engaged in tourism related services:
  - Guesthouses
  - Transportation
  - Guiding
  - Renting horses
  - Selling traditional handicrafts

Figure 17. People engaged in NBT activities in TPAs

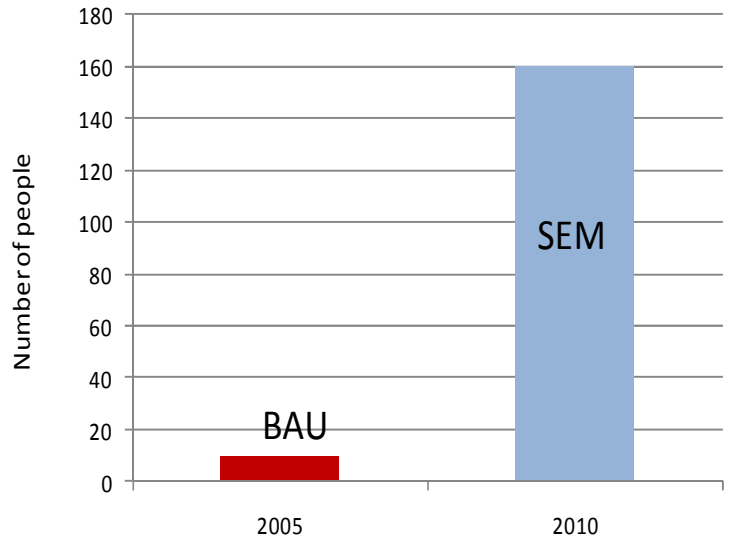
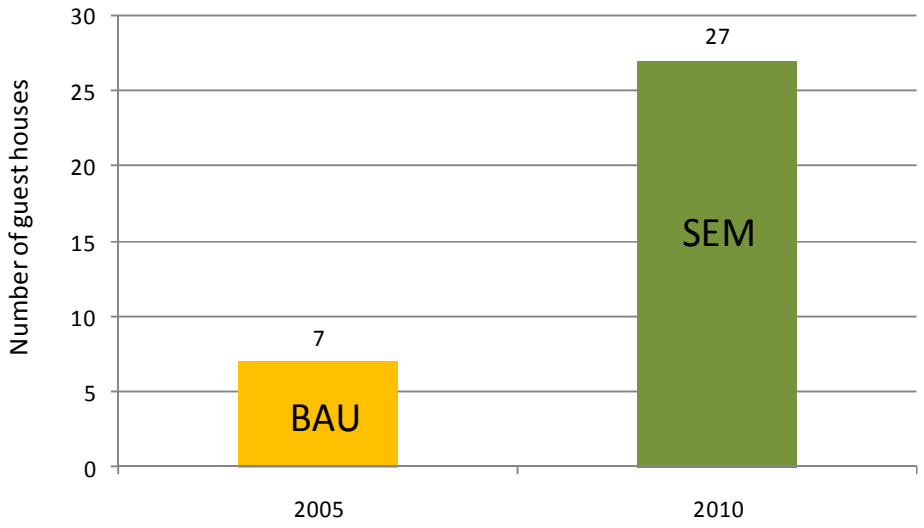


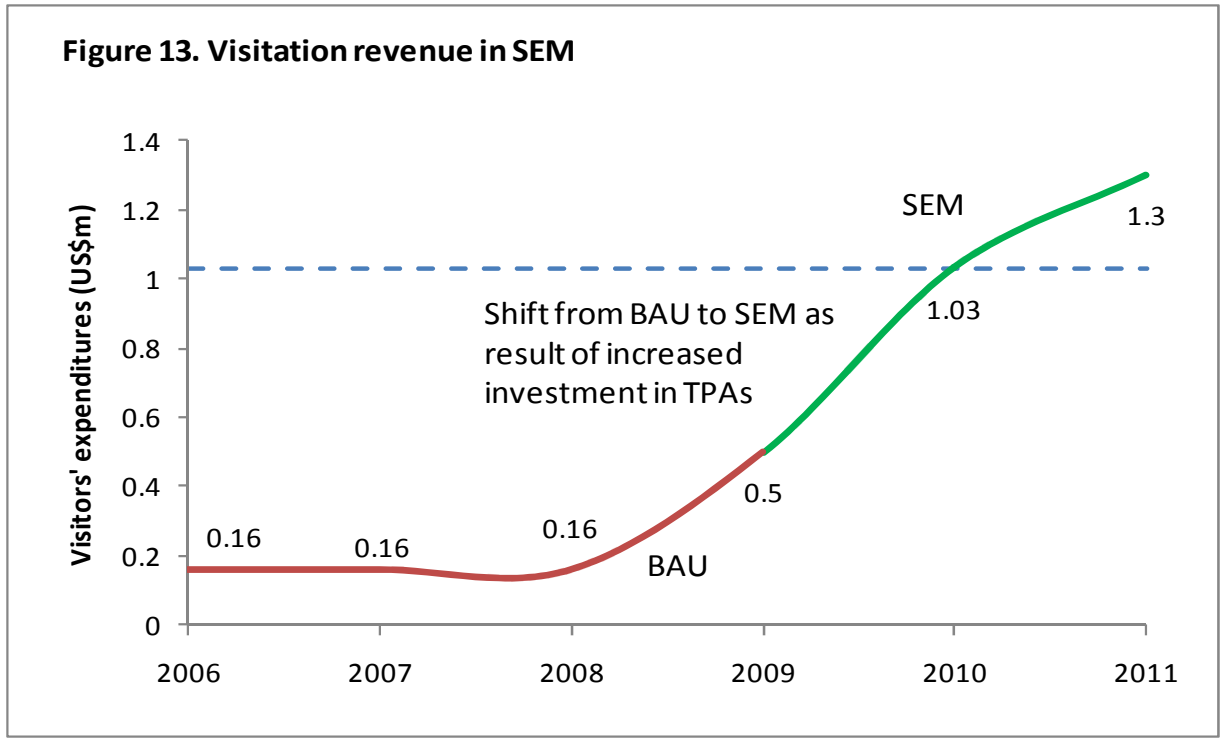
Figure 16. Increse of guest houses in TPAs



Source: Consultant

Nature based tourism in TPA

- **Gross income of local people from NBT related activities**



Gross income of local people from NBT related activities in TPA is estimated 1.8 mln GEL (1.1 mln USD) in 2010

Source: Consultant

Contribution of the PAs and related ecosystems to Agriculture

- Irrigation water supply (e.g. in Kakheti region)
- Pollination (e.g. citrus around Mtirala NP)
- Climate regulation (e.g. around Mtirala NP)
- Livestock breeding and crops production (e.g. in Tusheti PAs)
- Honey production in the BKNP and MNP support zones

Contribution of the PAs to Hydropower

- Many HPPs run on waters originating in PAs or related ecosystems

- GoG has ambitious plans for developing hydropower sector: State Program "Renewable Energy 2008" includes 21 new hydropower projects with total installed capacity of 1,583 MW and generation of 5.5 billion KWh.

- Sustainable watersheds management is indispensable to secure water flow and savings (from avoided replacement costs), and economic benefits from hydropower generation.

Contribution of the PAs network to Fresh water supply

•Large amount of freshwater resources are formed on the territories of TPAs, MNP and BKNP,

• E.g. Batumi with 140 000 population and more than 0.5 mln tourists per year receives drinking water from MNP;

• BKNP and related ecosystems provide indispensable natural resource to support a large sub-sector of the economy in Georgia - the bottled spring water industry. **IDS Borjomi Georgia** bottles 400,000 ~ 500,000 liter (400,000 ~ 500,000 GEL) spring waters of "Borjomi" and "Bakuriani" brands per day.

Contribution of the PAs to mineral water industry

• **IDS Borjomi Georgia** produces 400,000 half liter bottles and 250,000 one liter bottles of "Borjomi" and "Likani" mineral waters per day. The gross value of such production is approximately 26 USD million, and 60-70% of the "Borjomi" mineral water is exported to 30 countries.

Photos: "Borjomi" Water website

Contribution of the PAs to Fishery

- Georgia's abundant water resources are fundamental to sustain marine and fresh water fish stock
- For example, there are 3 fish farms using waters originating in BKNP. The market value of 35 tons of fish produced annually is estimated at 207,000 USD
- There are also 30 fish farms in the MNP support zone where 74 people are employed. Total annual production of these farms amounts 142 tons of fish with total market value about 970,000 GEL (584,000 USD).

PAs Contribution to poverty alleviation

• PAs and related ecosystems under SEM can contribute to poverty alleviation and equity.

• There is a range of services linked to the use of natural resources of the PA that support poverty alleviation such as:
- firewood collection
- non-timber forest products (NTFP),
- bee keeping
- guesthouses, stables,
- livestock breeding
- employment in parks' administrations.

• For example, gross of these benefits in the MNP support zone are estimated at 3.4 mln GEL (2 mln USD) per year;

• In BKNP support zone total value of collected NTFP is more that 1 mln GEL (0.6 mln USD) per year;

Illustrative annual aggregated value of selected sectors

Sectoral output (sample)	USD (Millon)	Euros (Million)
Wine production (exports)	23,8	17,9
Livestock / dairy (exports)	17,3	13,0
Tourism /Nature-based tourism	837,1	630,4
Hydropower (Energo-Pro)	102,2	77,0
Borjomi water	26,6	20,0
Carbon sequestration BKNP and MNP	7,0	5,3
Fresh water in Batumi	4,1	3,1
Estimate	**1 018,2**	**766,8**