

Title: The Agricultural Climate Governance Policy - PGCA, the Agricultural Market for Emissions Reductions – MARE and the Platform for Business on Environmental and Ecosystem Goods and Services - PNBSAE in Brazil

Theme: Earth System Governance Architectures in the 21st Century

Abstract

Green Economy signalizes major opportunities for products and services holding environmental and social benefits, being somehow approached by World Trade Organization and United Nations Conference on Trade and Development as Environmental Goods and Services. At the same time this creates a movement towards valorization of Ecosystem Services such as carbon cycling, water quality and quantity, biodiversity and many others. With the aim of mainstreaming ecosystem services at production and service chains and increasing overall competitiveness for this new era of sustainable development, the Mato Grosso Industry and Agriculture Federations inaugurated in 2010 a Unity for Environmental and Ecosystem Services. This unit has been responsible for developing the Verde Rio project into a Green Infrastructure proposal, with the inclusion of it as a ecosystem services supplier within the newly created Platform for Business with Environmental and Ecosystem Services – PNBSAE/MT, which is a form of establishing a governance system for accomplishing the above mentioned task. PNBSAE has performed circa of US\$ 750,000 deals of carbon credits between local communities and 50 participating organizations up to 2012.

1. Introduction

A practical Green Economy is based on atmospheric, liquid and solid pollution control. Green Economy favors income and job growth by public and private investment to rehabilitate, maintain or improve environmental goods and services production and provision conditions, and which preserve ecosystem services. This form of development values natural resources capital value and its societal relevance (UNDP, 2011).

Production activities at rural properties such as agriculture, farming and reforestation dominate men land use (MORRIS, 1995) and hold direct relationships

with the ecosystem services supplied by the regions they occupy. Among ecosystem services directed related to those land use practices genetic, species and ecological process variability, pollinators, seed dispersion, plagues and diseases control, water quantity and quality, carbon sequestration and storage, soil formation, nutrient cycling and residues decomposition are relevant. Synergy between production of environmental and ecosystem goods and services at rural scenario is clear and can be promote and enhanced by territorial arrangements management which includes beyond commodities production, specific care to evaluate and maintain ecosystem services.

On the other hand, pollution resulting from fossil fuels burning, indiscriminate wild animals hunting and emissions of liquids into water bodies are examples of practices negatively influencing natural resources availability. Goods and services searching for ways of contributing to ecosystem services quality and quantity should be recognized as such, so the public can have access to opportunities of promoting those activities.

Regularly the government regulates and the market promotes environmental and ecosystem goods and services, in a Public Private Partnership for sustainable development at all levels.

2. Justificative

EGS at WTO and UNCTAD

Goods and services with an environmental background have gained interest throughout the civilized world. They include measures such as the water, air, soil impacts prevention, minimization and correction as well as addressing issues related to residues and noise production. In the international trade arena, the World Trade Organization (WTO) classifies the environmental services sector as sewage services, residues landing services, sanitary services in general and others (including recycling, sound barriers, rural scenery protection and other not classified in any other place).

According with the United Nations Conference on Trade And Development – UNCTAD, the EGS global market has grown 14% between 1996 and 2000 (US\$453 billion to US\$518 billion) and reached US\$722 billion in 2009, including equipment (chemical products and water treatment), services (residues management) and resources

(water supply nets and clean energies) as the main items. Developed countries dominate the market, with the USA having a 37% share; the EU, 27%; and, Japan, 12% (PLS 309/2010). In Latin America this market generated US\$29 billion in 2009, with Brazil being 47% of the total market. In addition, Brazil has 2% of the global market (US\$16 billion), and a recent study on Espirito Santo state revealed an EGS participation of US\$1.2 billion (around 2% of GDP) (HASNER et al, 2010).

These EGS are subjected to differentiated taxes and fees and the tendency goes towards overall liberalization of their trade at international level, a concept used to favor adoption of equipment, machinery and raw materials with more environmental quality. The machinery, equipment and infrastructure sectors need support from public policies and specific incentives at country level to have their production and consumption stimulated within society. This is a must for public policies' focus. Liberalization of international trade in EGS is expected to occur soon and developed countries already have a relatively consolidated market, while the opportunities being presented to developing countries are making them study ways of improving their economic sectors competitiveness.

Ecosystem Services at global level IPBES

Ecosystem services are provided, but not remunerated. The recognition of their societal role and importance is a form of promoting sustainable development. Environmental and ecosystem goods and services are linked to the Millennium Development Objectives – MDO number 7, in the sense they can be used to integrate sustainable development objectives within national policies and programs and reverse the lost of natural resources. It is a form of making environmental policy and valuing best practices at all levels. The preserved environmental assets conserved and managed by public and private entities become eligible for remuneration. This is a theme advancing contemporary society, with initiatives such as REDD, REDD+, water producers, protected geographical identity, biodiversity banks and a large number of others, turning into the so called “Payment for Ecosystem Services” or PES.

The identification, recognition and remuneration of environmental and ecosystem goods and services are crucial for business. Among companies, the brands with stronger appeal and value are those which represent a favorable consensus of

subjectivity – pleasure, quality, proposal and security. To reach that, and become valued by the public, the brand must stay positive, portraying subtle differentiation contributing to improve the world we live in. The public does not get convinced momentarily but through a process of identification with the brand aspects. The most valued brands are those reacting to society critics and creating marketing programs and strategies directed at neutralizing their impacts on the planet. The actions must be sustainable, the consumer needs to be always informed of news on activities that bring value to brands, and certification is an important part of this process (BRANDZ, 2010).

Ecosystem services are used by enterprises and this relationship presents a series of risks, including physical (operations interruption related to ecosystem services supplying gap causes – water scarcity, pollinators reduction etc), reputational (have its name connected to environmental destruction) and financial (costs of rehabilitation, maintenance and improving conformity with previous items). The ways companies decide to use for addressing these themes vary, but similarities can be pointed out.

Short term activities are reactive and companies take them as a solution after accidents. They are operational responses to environmental issues. Actions taken to discuss project activities with the public and other stakeholders aiming at a long term economic valuation are more pro-active on the sense they bring a tactical model of relating to environmental questions. The highest level of entrepreneur compromise with the environmental theme is represented by corporate socio-environmental responsibility (CSR), which includes establishing internal regulations and the search for operational and managerial certification. The certification is a way of differentiating products for consumers.

Nowadays the international transit of environmental goods and services (EGS) and PES is the most important focus of an emerging concept: carbon restricted growth. How the international trade can contribute to reduce human activities impacts on the environment turns each day into a function of regulatory instruments. Among such instruments, the measurement of ecosystem services impacts on different production and service chains, and is growing faster within the economy, green or not.

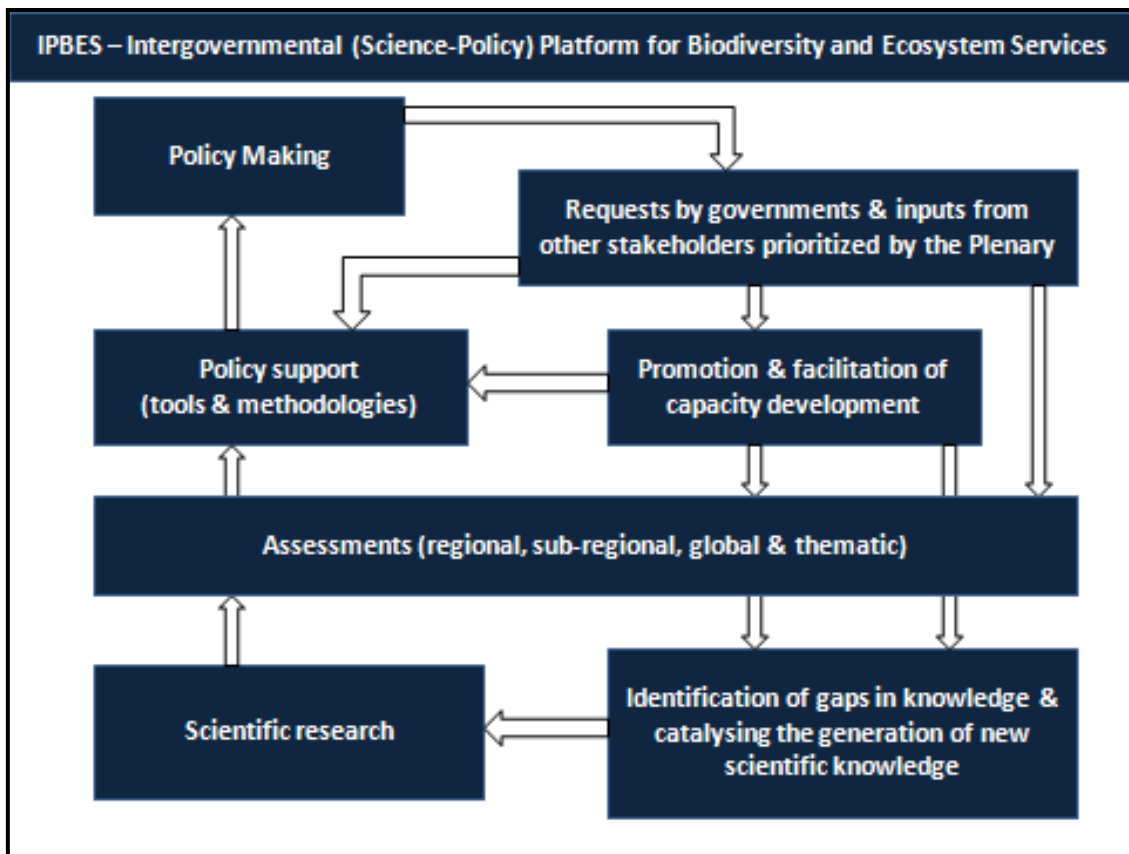
In the PES arena the UN Food and Agriculture Organization (UN FAO) is directing its efforts to ensure those in the ecosystem sector, including cropping, farming and forestry, are appropriately remunerated for the services they provide. The PES works at production and service chains as a positive incentive for best practices adoption of land cultivation. Individuals, companies and public and private institutions

that use or produce any sort of impact at a determined ecosystem service can remunerate the production or service chain to reduce or eliminate this impact.

Ecosystem services have a global value estimated at US\$33 trillion per year (WBCSD, 2009) with strong participation by Brazilian entities, considered one of the main global players in a growing green economy. On the other hand destruction of flora and fauna costs US\$ 3.1 trillion yearly to the world, around 6% of all nations' GDP. In Brazil, the Amazon forest alone it is estimated US\$ 4 trillion per year can be assigned as the value of ecosystem services. However, currently, there are only a few isolated cases of PES in place. Nevertheless the number of local, sub-national, national, regional, international and global public and private institutions and organizations including industry, agriculture, construction, energy concessionaries, transport, reforestation, universities, research centers, NGOs, foundations and others, interested on PES and EGS are growing fast.

With the aim of producing scientific and political proposal to incorporate this new reality to daily economic activities, the Intergovernmental Science and Policy Platform on Biodiversity and Ecosystem Services (IPBES) has been assembled and its headquarters are to be implemented in Bonn, Germany. The IPBES is the ultimate forum at global level responsible for organizing and supplying information on the theme of biodiversity and ecosystem services to all governments on the planet. It will provide a mechanism of support for decision-making around the theme and identify tools and methodologies relevant for governments. The Figure 01 demonstrates the relationships among functions of the platform and between the platform, policymaking and scientific research:

Figure 01: Functions of platform and relationships



Source: UNEP, 2012

IPBES influences policy making by supplying tools and methodologies for decision making, which by its turn is based on governments and other stakeholders' requests and inputs from the plenary of the platform. Those requests and inputs are used to promote and facilitate capacity building, as well as developing the tools and methodologies that will be used for policy making at country or regional levels. Assessment of methodologies and tools are based on the need for promotion and capacity building development, which also provide information to identify knowledge gaps and to catalyze generation of new scientific knowledge. Actually, scientific research – aimed at performing regular comprehensive assessments at various scales, as well as on thematic issues and new topics identified - is the way for understanding the latest trends regarding biodiversity and ecosystem services, the main function of the platform.

IPBES was officially established in April, 2012, by more than 100 countries present at the second general assembly in Panamá, as an independent intergovernmental body, jointly administrated by the United Nations Environmental Program, the UN Educational, Scientific and Cultural Organization, the UN Food and Agriculture Organization, and the United Nations Development Program.

3. Current Brazilian governmental policies

The Brazilian National Congress has before it some 20 proposal for a national policy on PES, but only two (with exactly the same content in both) address the theme of EGS and PES simultaneously, the PLS 309/2010 is the origin of such approach. The law proposals presented at the Brazilian National Congress are attesting the convergence between environmental, social and economic demands from sustainable development and the relevance this theme has gain within society.

The strategic objectives of a national policy aimed at enhancing the role of EGS and PES at both local and international levels must pay close attention to maintenance and positioning productive sectors and Brazilian enterprises amongst the world largest, looking into increasing markets, build competitiveness in strategic areas and define programs for the most important economy sectors. Differentiation is a highly valued asset for positioning the Brazilian brand within global markets.

To have those strategies effectively implemented they need to be oriented to service and productive chains focusing on factors that contribute to accelerating adoption of best practices and achieving long-term sustainability. Policies structured in a form that benefit production and consumption of EGS with positive impacts on the quality and quantity of ecosystem services is a way to guide production and service chains over factors assuring long term sustainability. A single overall orientation from a converging policy instrument of both EGS and PES is highly recommended, increasing the chances of success on implementing more democratic mechanisms to access this new green economy market which is at the same time economically, socially and environmentally inclusive.

With this concept of a single political instrument oriented towards EGS and PES, actions already set on “Acceleration of Growth Plan” or PAC (from Portuguese: Plano de Aceleração do Crescimento), are drawn from the following: The National Plan of Capacity Building from the Work and Jobs Ministry or TEM (Plano Nacional de Qualificação do Ministério do Trabalho e Emprego), the Program for Mobilization of National Oil and Natural Gas Industry – PROMINP (Programa Nacional de Mobilização da Indústria Nacional de Petróleo e Gás Natural), and the National Policy on Climate Change, the National Policy of Environmental Education, the National Policy of Water Resources, the National Policy of Solid Residues, and the New Industry Education Program.

The programs outlined above can be integrated into concerted actions towards national systems and policies of PES. At the same time the effort can gain from participation of efforts developed by the following:

- 🌿 The National Confederation of Commerce – CNC (Confederação Nacional do Comércio),
- 🌿 the National Confederation of Agriculture – CAN (Confederação Nacional da Agricultura),
- 🌿 the Unions,
- 🌿 state federations of industry, and
- 🌿 representatives from local associations.

Many others will have a crucial role in building the permanent capacity by structuring programs, and presenting and discussing private interests with the public sector at existing forums. These include:

- 🌿 The National Research & Development & Engineer Association of Innovative Industries – ANPEI (Associação Nacional de Pesquisa, Desenvolvimento e Engenharia das Empresas Inovadoras),
- 🌿 the Brazil Competitive Movement – MBC (Movimento Brasil Competitivo),
- 🌿 the National Association of Entities Promoting Innovative Entrepreneurships – ANPROTEC (Associação Nacional de Entidades Promotoras de Empreendimentos Inovadores), and
- 🌿 the Technology Pro-Innovation at Enterprise – PROTEC (Pró-Inovação Tecnológica na Empresa),

Market practices with the free initiative providing room for demand and offer balance in a democratic way, valuing social inclusion, environmental respect and maximizing economic benefits need to be regulated and enforced by public power. This is a way of having the value of EGS and PES recognized as an instrument to give trust and transparency to transactions involving ecosystem services.

The PLS 309/2010 containing the proposal for a National Policy on Environmental and Ecosystem Goods and Services was structured observing the necessity to integrate and coordinate sector policies of EGS from industry, commerce, transport, energy, construction, residues, environment, agriculture, farming, forests, fishing, aquiculture and urban development directed to maintain, rehabilitate or improve ecosystem services.

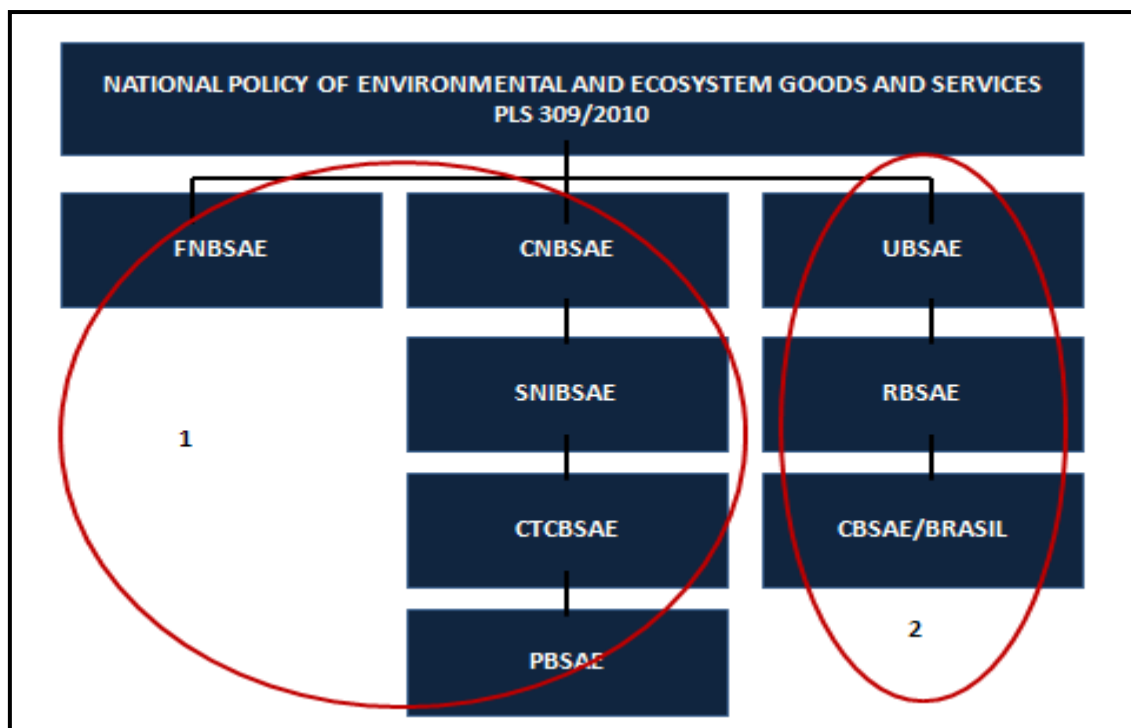
This policy is directed at maintaining or positioning production systems, exports, Brazilian brand and Brazilian enterprises at the highest level in international negotiations at the same time as contributing to enlarging the supply of EGS and ecosystem services to the world's population.

As a public policy, it looks at defining the state's role as inducer of positive behavior change by using this instrument to influence all national production and service chains in adopting adequate practices when managing their environmental impacts. It also aims at rewarding good conduct as the basis for social, environmental and economic human adjustments, using PES as an instrument for promoting sustainable development. It searches for ways of recognizing the need to use natural resources with responsibility and technical knowledge inputs to ensure the protection and integrated quality and quantity of ecosystem services. This can be achieved, for example, by:

- 🌱 Supporting the forming, improvement and maintenance of corridors,
- 🌱 using territorial strategies as the biomes (IBGE), and
- 🌱 involving promotion of human actions of supply EGS and ecosystem services for enhancing priority areas for conservation, sustainable use and benefit sharing.

The PLS 309/2010 starts by stating within its main objectives, how policy is directed to regulate EGS and PES “to discipline public power actions related to recognition of the value of EGS and of the ecosystem services and regulate the registering and inventorying of those goods and services” and “to promote sustainable development with focus on national production chains environmental adequacy, establishing mechanisms for the PES”. The overall systematic adopted by the proposal is demonstrated on the Figure 02:

Figure 02: Diagram of the National Policy on Environmental and Ecosystem Goods and Services proposal (PLS 309/2010)



Source: Author.

The National Policy of Environmental and Ecosystem Goods and Services has three main instruments:

- 🌿 The National Fund of Environmental and Ecosystem Goods and Services – FNBSAE (Fundo Nacional de Bens e Serviços Ambientais e Ecológicos),
- 🌿 the National Council of Environmental and Ecosystem Goods and Services – CNBSAE (Conselho Nacional de Bens e Serviços Ambientais e Ecológicos), and
- 🌿 the Unity of Environmental and Ecosystem Goods and Services – UBSAE (Unidade de Bens e Serviços Ambientais e Ecológicos).

The FNBSAE and the CNBSAE are the main institutes responsible for elaborating on values to be paid and other tax and fee subsidies to accomplish the policy goals, with their subsidiary bodies, as follows:

- 🌿 The National Service of Information on Environmental and Ecosystem Goods and Services – SNIBSAE (Serviço Nacional de Informações sobre Bens e Serviços Ambientais e Ecológicos),

- 🌿 the Technical Scientific Council on Environmental and Ecosystem Goods and Services – CTCBSAE (Conselho Técnico-Científico de Bens e Serviços Ambientais e Ecosistêmicos), and
- 🌿 the Panel on Environmental and Ecosystem Goods and Services – PBSAE (Painel de Bens e Serviços Ambientais e Ecosistêmicos).

The UBSAE is responsible for establishing mechanisms of transferring payments and certification supply, supported by its subsidiary bodies, as follows:

- The Register of Environmental and Ecosystem Goods and Services – RBSAE (Portuguese: Registro de Bens e Serviços Ambientais e Ecosistêmicos), and
- The Certification of Environmental and Ecosystem Goods and Services – CBSAE/Brasil (Certificação de Bens e Serviços Ambientais e Ecosistêmicos).

This policy proposal understands ecosystem services and EGS as the basis for building competitiveness for Brazilians at green economy era, therefore it expressly address the Ministry of Development, Industry and Commerce – MDIC (Ministério do Desenvolvimento, Indústria e Comércio) as the main institution to hold responsibilities for its implementation and development at all levels, assisted by a series of other ministries (Ministry of Environment, Ministry of Agriculture, Ministry of Agrarian Development, Ministry of Defense, and others).

4. Current Private Sector Activities

TEEB initiative is relatively new in Brazil, so this paper will cover activities related to agriculture, farming and reforestation. The Agriculture Climate Governance – PGCA (Política de Governança Climática da Agropecuária) was established as a result of a yearlong process of consultation with the 27 agricultural federations in Brazil, representing over 5,000 unions all over the country.

This strategic analysis of the sector was conducted towards workshops, research and studies involving national and international institutions directly addressing the sector, interviews with researchers from private sector enterprises, universities, governmental and non-governmental organizations and financial institutions. It also included analysis of the main national and international publications regarding the theme, as well as

participating at the most relevant events on agriculture, farming, forests and sustainability.

With this approach the strategic analysis was able to produce a conscious positioning regarding the National Inventories of anthropogenic GHG emissions, an international benchmarking study with the perception and evaluation of risks and identification of opportunities.

Within the study many national and international regulations were approached, including the UNFCCC, Kyoto Protocol, Desertification Convention, CDB, National Policy on Climate Change, National Plan on Climate Change, Low Carbon Agriculture Plan – ABC (from the Portuguese: Agricultura de Baixo Carbono), reduction goals for the agriculture sector (circa of 6%), best practices to achieve the reduction goals and Durban Platform.

As conclusion of the work some strategic actions were drawn, including the preference for a voluntary regulation, the production of guidelines for defense and preservation of the environment, give priority to scientific research, technology innovation, capacity building and the use of market mechanisms. The last is foreseen to become an instrument of sector mobilization reaching all agribusiness production and service chains.

It became crystal the necessity of action. Climate change can cause severe damage to environment and agriculture. The sector needs to learn how to reach a high level of compliance to economic tendency of low GHG emissions activities. The rural landowner has a decisive role on acquiring a prominent position as a solution to the problem of climate change. For that it is essential to build capacity and guide rural sector towards adaptation and mitigation best practices of land use. The rural sector, or AFOLU (Agriculture, Forests and Other Land Uses) emerges amongst other economy sectors as the one supplying emissions reductions or increasing sequestration and storage of carbon in a highly efficient and costless way.

The work also resulted on principles which would guide PGCA: Principle of Capacity of Action in Favor of Climate – general principle; Principle of Participation, Transparency and Information; Principle of Conservator-Receptor; Principle of Cooperation; Principle of Common, but Differentiated, Responsibility and; Principle of Sustainable Development and Food Security.

The main objective of PBCA is to promote and guide agriculture sector on implementing climate smart activities and sustainable development, towards emissions

reduction and sequestration and storage enhancement, with the aim of stabilizing GHG levels within the atmosphere; adaptation to climate change and environmental conservation resulting on rural areas economic activities less GHG intensive without compromising productivity.

The specific objectives include reducing GHG emissions and increasing carbon sequestration and storage, improve agriculture GHG emissions accountability; food security, production efficiency; technology development and exchange; identification and minimizing vulnerability; poverty reduction and economic benefits. The capacity building specific objective should go into inventory and low carbon agriculture practices.

The low carbon agriculture practices are driven to emissions reduction and carbon sequestration and storage capacity enhance with projects involving: degraded area rehabilitation; agriculture-farming-reforestation integration; non-tillage systems; biological nitrogen fixing; planted forests; domestic animals manure treatment; agribusiness energy efficiency; enteric fermentation techniques application; organic compounds produced from confined cattl. It also includes a Program of Adaptation to Climate Change; a Program of scientific and technological R&D and Training and Capacity Building Program.

The PGCA has three major instruments for its implementation: Financial (CNA fund for R&D; Platform for Business with Environmental and Ecosystem Goods and Services; Emissions Reductions Agriculture Market – MARE - from the Portuguese: Mercado Agropecuário de Redução de Emissões); Technical (Climate Lab and Climate and Environment Observatory) and; Governance (Strategic Themes Commission and Scientific Committee).

MARE (Agriculture Market for Emissions Reductions)

During the COP15 the Brazilian government has public assumed a voluntary goal of reducing between 36,1 to 38,9% of its emissions up to 2020, accounting for almost 1 billion tCO₂eq, with agriculture, farming and reforestation answering for 133 to 166 million tCO₂eq. The Federal Government made available a finance mechanism for adopting best management practices to consolidate it, the Low Carbon Agriculture – ABC. ABC had more than US\$ 1,5 billion for 2011/2012. Those activities need to be

Measured, Reported and Verified to become eligible for a NAMA (Nationally Appropriated Mitigation Activity).

To comply with MRV demands the Multi-Institutional Virtual Laboratory on Climate Change and Agriculture was established, with the aim of demonstrating the reference scenario (baseline) for the period (2012-2020) addressing each planned project activity and the methodologies applied for estimating and calculating reductions or increments on sequestration and storage in order to assure quality and allow international verification.

For MARE development the National Agriculture Confederation – CAN (from Portuguese: Confederação Nacional da Agricultura) will supply guidance to rural landowners in order to access finance with credit institutions, low carbon agriculture technical projects, carbon credits generation project documents, monitoring of field implementing, verifying and registering of credits and commercialization of those credits at local, sub-national, national, international, regional and global markets.

Available finance comes from ABC program, Climate Change National Fund, national and international funds for sustainable rural activities, sponsors, supporters and donations from national and international public and private organizations, as well as any specific fund to be created within PGCA framework.

MARE covers project activities focusing on degraded areas rehabilitation, agri-farm-forest integration and agroforestry systems, non-tillage, Nitrogen biological fixation, planted forests, manure treatment for energy production, energy efficiency at agriculture and farming, enteric fermentation techniques application and organic compounds production from confined cattle ranching.

Platform for Business with Environmental and Ecosystem Goods and Services - PNBSAE

Due to the joint effort to build a MARE initiative the use of online systems for all steps is strongly advised, the construction of an electronic platform is foreseen to connect project activities to individuals, companies, public and private organizations and others interested on compensating their carbon emissions.

Marketing ecosystem services is new and challenging. It is necessary for people to understand and value solid, liquid and gas pollution control of production and service chains. Mainstreaming ecosystem services at production and service chains would mean

to create conditions for green economy sustainable development. Carbon credits are one example of a series of services freely provided by nature which can be actively managed by humans.

Management activities are driven to rehabilitate, maintain and increase ecosystem services provision while contributing to green economy development of EGS chains at all levels. The PNBSAE is the mechanism for developing initiatives towards green economy implementation at all levels.

Rules for operation, steps and phases, organization and general principals need to be in place for assuring consistency. Those rules are guidance for procedures needed to assure adherence to the most advanced available and proposed legislation on the subject, nationally and internationally. They should include specifics for a certification to both rural landowners and participating corporations, organizations, individuals and others.

PNBSAE's rules must include specific procedures for methodologies adoption, consultants and auditors, GHG inventories, PIN, projects and credits and monitoring registration.

Methodologies are made available for interested parties, as tools to Measure, Report and Verify (MRV) their ecosystem service credits. Those tools are necessary for developing project documents and request registration. Methodologies can be applied or developed, in which case they will need to go through public consultancy. Both official and voluntary methodologies apply.

Consultants and auditors are trained to operate within the platform environment and provide services for interested parties. The consultant operating within the platform has to have previous training on each of the methodologies he / she intend to use or audit. Their procedures are regulated within the platform by its statutes and professionals from various areas are to be considered eligible to participate, according to the sector their work is involved with.

GHG inventories are registered to make a public statement of enrollment on addressing climate change or the air pollution contribution of individuals or organizations. Without having an inventory of an environmental impact is difficult to become a member at the platform or to use its services. It might happen, but there need to be some specifics on the rules regarding it.

Project Idea Note – PIN registration and public exposure is allowed in order to identify markets before developing project documents and field activities. An individual or organization willing to participate at the market can register its PIN and wait for an

offer before developing the project, avoiding early expenditures and investments and reducing risks. After receiving an offer the project and credits can be developed and registered, most of the times using the moneys from the buyer.

Monitoring reports are essential to assure attachment to overall objectives of reducing emissions or increasing carbon sequestration and storage. Monitoring are performed on a mix of GIS, field and landowners reports.

The platform is a mechanism to promote PGCA and MARE, as well as any activity directed to capitalization of nature. It can perform tasks related to generate credits, provide certification to best practices and strategic evaluation of natural capital stocks and flows within a determined property, municipality, state, country, region or globally. It promotes sustainable development by valuing ecosystem services and mainstreaming local environmental quality to production and service chain, enhancing their competitiveness at green economy.

5. Material and Methods

The community of family agricultures of Barranco Alto I and Barranco Alto II at the margins of Cuiabá River, in Mato Grosso is the material of the current study case. Mato Grosso state in Cerrado region which firstly inaugurate a prototype of platform to promote EGS and PES at all levels. It is operated by introducing remuneration of ecosystem service as a prerequisite for certification of EGS.

Methodology of the study was based on literature review, interview with actors and site evaluation. Data collected referred to variables related to project concept, documents and field implementation & monitoring. Those data were organized by describing the organization leading the work, its partnerships and governance, implementation and monitoring. Results are presented in form of a project description including steps and achievements over the 4 years of activities.

6. Results

Study Case – Family Agriculture at Cuiaba River Margins and Water Security: Verde Rio Project Pantanal / Cuiaba River Phase

At the Cuiaba river margins close to Santo Antonio do Leverger, a municipality circa of 50 km from Mato Grosso Capital is located two communities named Barranco Alto I and Barranco Alto II, with around 500 families at both. Those communities were included within the 2.167 family agricultures interviewed within Verde Rio Project activities and selected as the first to receive the benefits from the initiative. The Verde Rio project is developed by Instituto Ação Verde.

Instituto Ação Verde is a NGO (OSCIP – from Portuguese: Organização da Sociedade Civil de Interesse Público) comprises majority of productive sector representatives in Mato Grosso within its board and is responsible for implementing a 2020 targeted Green Infrastructure proposal based on the rehabilitation, maintenance and enhancement of nine main rivers from the tree biomes within the State (Amazônia: Telles Pires, Juína and Aripuana; Cerrado: Araguaia, Xingu and Das Mortes; Pantanal: Cuiabá, Paraguai and São Lourenço).

Instituto Ação Verde has consolidate several partnerships for governance of its activities, many times occurring due to the project multidisciplinary characteristic. Resulting from this the Mato Grosso State Government participates with the Environmental Secretary – SEMA (from portuguese: Secretaria de Meio Ambiente), Secretary of Rural Development and Family Agriculture – SEDRAF (from portugues: Secretaria de Desenvolvimento Rural e Agricultura Familiar) and Secretary of Industry & Commerce, Energy and Mining – SICME (from portuguese: Secretaria de Indústria e Comércio, Minas e Energia). Other partners include Rural Research, Assistance and Extension Enterprise - EMPAER (from portuguese: Empresa Matogrossense de Pesquisa, Assistência e Extensão Rural), Mato Grosso Land Institute – INTERMAT (from portuguese: Instituto de Terras de Mato Grosso), Federal University of Mato Grosso - UFMT (Universidade Federal do Estado de Mato Grosso), State Public Ministry – MPE (from portugese: MINISTÉRIO PÚBLICO ESTADUAL) and city halls of municipalities which are recruited along implementation and become references for local activities. Withing the project governance local political leaders are pillars of activities implementation and influence objectives and procedures, according with

Technical Cooperation Terms celebrated at each of them. The Industry Social Service – SESI (from portuguese: Serviço Social da Indústria), National Service of Industry Capacitation – SENAI (from portuguese: Serviço Nacional de Aprendizagem Industrial) and the Energética Águas da Pedra consortium.

Verde Rio Project implementation methodology include satellite imagery assessments, interviews with landowners, socioeconomic appraisal, environmental diagnosis, degraded area location (coordinates), floristic inventory, nursery operation, elaboration of rehabilitation of degraded area projects – PRAD (from portuguese: Projeto de Recuperação de Área Degradada), environmental awareness, field trips, public hearings, workshops, and PRAD implementation (fencing, planting – including supply and transport of plants, tending).






At Cuiaba River the project focus on avoided deforestation and reforestation with native species at degraded areas. The Verde Rio Project works with local communities at river margins and recently has started to implement Payment for Ecosystem Services (PES) activities for carbon, aiming to also incorporate water and biodiversity credits. For that purpose, Instituto Ação Verde is implemented a prototype of the PGCA mechanism, the Platform for Business with Environmental and Ecosystem Goods and Services of Mato Grosso (PNBSAE/MT), which supports companies and communities by providing guidance and certification to participants. It is expected that Green Infrastructure of Rio Verde Project will provide for a more resilient and adapted ecosystem, able to face climate change and the threats posed by a loss of biodiversity and ecosystem services.

UBSAE/MT and PNBSAE/MT

There are several different methodologies around the globe available for assessing environmental, social and economic impacts of production and service chains. From the environmental point of view, it is possible to measure impacts on greenhouse gas emissions, quality and quantity of water, biodiversity conservation and genetic variability, scenic beauty, pollinators and a series of ecosystem services. With the emergence of the environmental management systems in the 1970's, the steps to avoid, minimize and rehabilitate the damage caused to natural resources were started. Nowadays, tools and methodologies are available for assessing a large number of production and services chains, and the life cycle assessment, or LCA, has become a

standard procedure at most companies, especially at the large national and international ones, with the medium and small companies gaining momentum in this area. An institutional approach is needed to provide Brazilian national production and services chains with tools and methodologies to analyze and prepare themselves to meet this new reality, while taking advantage of the country's large availability of natural resources to improve their competitiveness.

In July, 2010, the Mato Grosso Unity of Environmental and Ecosystem Goods and Services (UBSAE/MT) was created by the following agencies: Mato Grosso Industry Federation – FIEMT (Federação da Indústria de Mato Grosso) and Mato Grosso Agriculture Federation – FAMATO (Federação da Agricultura de Mato Grosso). The UBSAE/MT is guided towards the objective of promoting issues regarding the EGS and PES, and positioning the industry, agriculture, farming and forestry sectors with the state regarding the theme. The UBSAE/MT was created under a ‘cooperation term’ which includes participation of the following agencies:

-  The Institute Evaldo Lodi (IEL)
-  The Mato Grosso Institute of Agrofarming Economy (IMEA)
-  The National Service of Industrial Learning (SENAI)
-  The National Service of Rural Learning (SENAR), and
-  The Instituto Ação Verde.

The UBSAE/MT subsequently determined the need for the installation of a platform for trading ecosystem credits and performing certification of environmental goods and services, which was done by PNBSAE (the Platform of Business on Environmental Goods and Services and Ecosystem Services). The PNBSAE is the operational branch of the UBSAE/MT, and the Instituto Ação Verde, a NGO from Mato Grosso is responsible for its management at this early stage.

PNBSAE has been established by the Statutes of Instituto Ação Verde in 2012, setting it under the Executive Secretary attributions to see for it adequate functioning, respecting its regulation. PNBSAE, which searches into strategies for enhancing natural capital values along production chains, works with all sectors and all kinds of landowners, be it small, medium or large ones. The Institute is working on implementing a “green infrastructure project and promoting “green commodities”. It

works with small landholders to support their environmental adequacy, and by that it enforces, with its institutional partners, so that food and fiber production chains can cope with the biodiversity maintenance across landscape scenarios. The PNBSAE is involved in identifying ecosystem services that need to be properly managed and it incorporates phases of determining those eligible for the following:

- Remuneration,
- the providers of such services which receive the payments,
- the value of those,
- establishing a transfer mechanism,
- defining methodologies for measuring their amount and quality and
- further supporting the establishment of local Offices of Environmental and Ecosystem Goods and Services, which can accelerate incorporating this systematic and spreading the objectives and procedures towards all municipalities in the state.

PNBSAE has responsibility for norms and regulations, value indicators, buying and selling of ecosystem credits, marketing, managing the system, supervision and technical assistance, investing and financing initiatives and monitoring and certification of companies and rural landowners. The brand used is the “Biome Cultivator (CO₂, water, biodiversity and so on): Living Ecosystem”.

The institute is performing early transactions with carbon, and has already undertaken two years of payments, involving 19 companies’ GHG inventories compensation. Based on the PNBSAE experience the proposed law was prepared and sent to the Brazilian National Congress in 2010 (PLS 309/2010), and a State Law with similar guidelines presented to Mato Grosso Parliament in 2011.

With those 28 public policies are being proposed and the current level of activities at the PNBSAE, there are great expectations regarding its predicted achievements. The PNBSAE can be used to estimate the total contribution of environmental goods and services within the state, as well as estimating the total ecosystem services available. By doing so, it creates an environment to further encourage and promote production and consumption of environmental goods and services, and mainstream ecosystem services within the state traditional production and service chains. This will promote the image

of the state as environmentally friendly as well as enhancing competitive advantages of its producers and services providers. On the environmental side, it creates opportunities for further implementing policies for a green infrastructure plan for the whole state, turning its producers into green commodities suppliers.

In May 2012, Institute Acao Verde, in partnership with Instituto Brasil and GVC Italy, hosted an International Conference on Green Economy, the [AMBIENTAL 2012](#). It aims to further promote the PNBSAE/MT and help increase markets for ecosystem services. The international conference brought together representatives from different countries and serve as a basis for increasing PNBSAE/MT and Institute Acao Verde's participation in shaping the global biodiversity and ecosystem services agenda.

Institute Acao Verde looks forward to participating in the International Partnership for the *Satoyama* Initiative and strengthening global cooperation. The institute wants to present its case and discuss necessary improvements with the global community in order to improve it so that it can be as useful as possible. Most of all, we want to make our activities of service to the *Satoyama* Initiative, and learn how to collaborate towards protecting the biodiversity of both wild and human-influenced natural environments by implementing its goals of long term sustainability with the Verde Rio project.

During the 2012 event, IORA ECOLOGICAL SOLUTIONS Pvt. Ltd., ,New Delhi, India, GRUPPO VOLONTARIATO CIVILE, Belo Horizonte MG and INSTITUTO BRASIL DE ESTUDOS, PESQUISAS E GESTÃO ESTRATÉGICA DE COMPETÊNCIAS, Viçosa, MG, further joined by REENEW, Accra, Ghana, and INSTITUTO AÇÃO VERDE, signed a MOU for collaboration on the following:

1. Technical:
 - a. PES methodologies (Carbon, water, biodiversity, pollinators, energy efficiency, alternative energy, River Ecosystem Reserves – APP, Biome cultivator etc),
 - b. Clearing house (Santader, HSBC others) – on line payments for Platform
2. Political:
 - a. Proposal for law adjustments at local, sub-national, national, international and regional levels
 - b. Proposal for entering into an international (bilateral India – Brazil) agreement on EGS and PES
3. Markets & Trading:
 - a. Develop a Timber Certification and Ecosystem Certification for both countries
 - b. Develop proposals for fees and taxes for certified products into international trade
4. Financing:

- a. Proposals for World Bank, IDB, ADB, Amazon Fund etc
 - b. Proposals for foundations, NGOs etc
 - c. Private sector, investors (share on operations) etc
5. Joint Event in India (2012)
- a. COP CDB: jointly IORA launching of PNBSAE – Brasil & India & Italy

Specific projects on each initiatives or covering all of them are to be produced jointly and discussed over the next year. Decisions regarding adoption of any projects are to be made after their formal presentation to both institutions. All institutions declared to join the initiative on the spirit of collaboration for Green Economy concepts development.

In 2012 the platform reached US\$ 750,000 carbon credits negotiated within the PNBSAE, and registered the first methodology for biodiversity credits elaborated in Brazil. Circa of 50 organizations all over the country are participating and international partners are already sending project documents for registering.

7. Discussion

Ecosystem Services are defined by the Millennium Ecosystem Assessment (MEA) as functions of natural capital socially appropriated in order to maintain the capacity of life system support. Ecosystem services are grouped in Support, Provision, Cultural and Regulatory. The law proposal 309/2010 on a Brazilian National Policy of Environmental and Ecosystem Goods and Services defines ecosystem services as “functions and process of ecosystems relevant for preservation, conservation, rehabilitation, sustainable use and improvement of environment as well as promotion of human well being, and which can be affected by human intervention”. It also recognizes the MEA approach of grouping them into four blocks.

The World Bank has claimed that traditional measurements used for national accounts figures, such as gross domestic product (GDP), ignore the depletion of resources and damage to the environment. Therefore, it is recommending an inclusion of natural resources on national accounts figures, in order to improve country actions and policies for sustainable development (WORLD BANK, 2005). Including the value of natural capital is a vital step to achieve economic growth that is equitable and sustainable (STEINER, 2005 in WORLD BANK, 2005).

Although one can argue that depletion of natural resources is a path to development, and further on the increase of national wealth would provide for the necessary environmental adaptation, the discourse definitely marks a milestone in the direction of capitalizing on natural resources and the ecosystem functions that support, provide, regulate and culturally sustain livelihoods and national wealth.

This capitalization of ecosystem services is the subject of various multilateral forums over the latest years, from the traditional United Nations Environmental Program (UNEP) to the World Trade Organization (WTO), and local, sub-national, national, international, bilateral, multilateral and global organizations. Ecosystem services are coming into an era of recognition, when they will be freed from slavery and become remunerable under public and private policies and regulations. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) represents the latest effort on that direction.

Traditionally, humans have claimed nature as their mother, and no one seems to believe that services provided by such would ever be paid for. Now it becomes an integrated part of our economies, therefore it must have its services recognized, valued and remunerated in order to cope with sustainable development. And this means a lot for countries with large natural resource basis.

Brazil, for one, has a large resource base, is home of 20-30% of world biodiversity, 12-20% of potable water and some 14-28% of forest resources. The country possesses competitive advantages as a growing green economy. In fact, it probably has surpluses in most of ecosystem services and would gain with the possibility of trading those excesses at all levels. The trading such ecosystem services in the form of credits, which can be produced under specific circumstances is an emerging concept.

In order to be traded locally, sub-nationally, nationally and internationally, ecosystem services credits need to have their performance measured under an approach recognizable by world audience. This has to be done in a reporting way comprehensible to everyone and it must be overviewed by a third party in order to verify compliance with fundamentals and technical prescriptions. These are the basis for a “measurable, reportable and verifiable” procedure to mainstream ecosystem services and “green” the traditional economy.

Carbon credits first appeared as an asset traded in global markets, making a contribution to regulating climate change measured according with principles laid down by the Intergovernmental Panel on Climate Change (IPCC), providing guidelines for accountability all over the planet. However, biodiversity, habitat, water and other ecosystem services have been negotiated at all levels for even longer, with no specific guidelines on how to standardize procedures for their measurement, reporting and validation or MRV.

Nowadays, efforts are being made to democratize access to markets on those other ecosystem services as well. Only some highly specialized non-government organizations (NGOs) have had the opportunity to enter those markets so far. What is more, the competition is about to get wild for them, because once guidelines are published anyone will be able to enter and monetize nature for their own benefit.

Research and development of accountability, or monitoring systems directed towards expanding links to mainstreaming ecosystem services into production and service supply chains, involve:

- 🌱 analyzing trade-off scenarios for enhancing public policies/governance, scoping into terrestrial biomes,
- 🌱 focusing on small but also including medium and large scale producers, and
- 🌱 also include public policies and markets.

It is important to have an economic valuation of sustainable practices and provide private and public sector decision-makers with a range of different scenarios. These scenarios can cover public policy productive strategies and purchasing policy reforms by applying an updated methodology for valuation of ecosystem services provided by sustainable practice adoption within key economic sectors from selected landscapes. The ecosystem services impacted by the production and service chains are provided by healthy landscapes.

This will enable environment for maintenance of ecosystem functionality within productive landscapes of biodiversity importance, facilitate a national level dialogue between government institutions, agribusiness and industry representatives, international commodity buyers, and civil society groups to discuss and design public

policy frameworks that support improvements in the environmental performance production and service chains within key productive landscapes of high biodiversity importance.

As such it is important to establish coordinating platforms for the maintenance of ecosystem functions on a commodity-by-commodity basis. Local and national capacities must be built to ensure maintenance of ecosystem functions within economic sub-sectors. Institution-specific capacity building plans must be built for the implementation of the strategies and policies derived from food and fiber platform dialogues. This will improve knowledge and skills of staff from key institutions regarding the economic value of the ecosystem services provided by sustainable management practices within specific food and fiber supply chains. Improved skills will help institutions make the business case to producer companies they engage through their respective mandates, about adopting sustainable practices within key supply chains.

8. Concluding Remarks

With the evidence of increasing relevance of ecosystem services, discussions must focus on competitive advantages of having EGS related to ecosystem services. The availability of ecosystem services becomes a differentiation for companies and countries alike, therefore strategic thinking is needed to further access opportunities to improve national planning and sustainable growth. The trade in ecosystem services can be a way of harming competitiveness within the country selling credits. Attention should be paid focused on how countries can provide credits to the market at the same time as conserving environmental quality capacity by favoring their own sustainable development. If too many credits are transferred, the country's environmental quality is transferred and the industry within its borders cannot apply it to its own sustainable growth.

The green economy is coming into view not only because of a political decision, although political action is fundamental for its establishment, but also because society, and the consumers within it, realized the relevance of paying for the ecosystem services, so they don't become depleted. It is a result of close observation of relationships

between production and service chains' behavior related to their environmental, social and economic impacts. In the future more and more individuals, companies, institutions, organizations, governments and countries will join the new way of producing without harming the planet and this will make room for a tremendous growth of green economy market participation. Those individuals, companies, institutions, organizations, governments and countries must be prepared to greet this new reality, and the most integrated will survive, for the good of the planet.

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