

Considerations for the measurement of Green Jobs

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Derived from the invitation to participate in the “Technical experts consultation on labour statistics: mobile towards a statistical definition of green jobs” we allow ourselves to establish a process of discussion and analysis around the possibilities of doing a measurement of green jobs, with the intention of providing at least an opinion about it. Particularly considering that said concept is to a certain point innovative in the context of national accounting, given the methodological rigor required for the implementation of the central outline of the 2008 SNA.

In this process of analysis we also take the task of revising the subject matter in the context of national accounting, where even in its moment we expressed some comments at the interior of the works in charge of the London Group for Environmental Accounting, such as the document “Proposals for the statistical definition and measurement of green jobs”. The first expression that was manifested was observing the complexity of measuring green jobs, considering the fact that a big part of financial and non-financial societies, governmental dependencies and non-profit organizations (NPO) lack the identification of the number of green jobs available, seeing that the workers that make activities linked to environmental activities

“In work, employees gain other benefits beyond the economic one. Work allows having social contacts, developing skills, reaching a state of psychological well being or improving self esteem” (Amartya Sen).

simultaneously make other labors unconnected to the environmental boundary, also that the instruments for registering environmental activities are not too specific or exclusive of the activity (producers of specialized environmental services). Such is the case of the incorporation of job data in the production of

environmental goods and services, the use of socioeconomic groups of the families to value water and the use of energy and the access to resources and linking of the information on the state of health of the data on air emissions (see SEEA Rev. 2.76)¹.

In this opportunity, we are given the task of linking the green jobs outline with the economic, environmental and social context of the Green Growth initiatives, linking them with matters as important as decent work and the state of welfare, because they are elements that in the longer term will help to outline in a clearer way the quantification possibilities. Thus, it is clear that is not possible to talk about decent employment if this is neither productive nor developed in freedom conditions, equity and security², but even more, if it does not guarantee a working option in compliance with the respect of human dignity in a frame of life quality, included the right to enjoy a natural healthy environment. At the same time it is glimpsed that decent employment is heavily tied to the nature of the welfare state and life quality in the sense of security and certainty, the opportunities, income, equity, the formation of capacities, and of course, freedom.

Professor Amartya Sen says that the welfare state prevents that someone arrives to a state of existence that could be classified as embarrassing in a modern society. Because of that it is clear that is extremely embarrassing having to breathe daily (even against our own freedom) hundreds of particles harmful to human health, using unhealthy water to drink or bathe, as well as living in between piles of garbage and conversing with all kinds of harmful fauna.

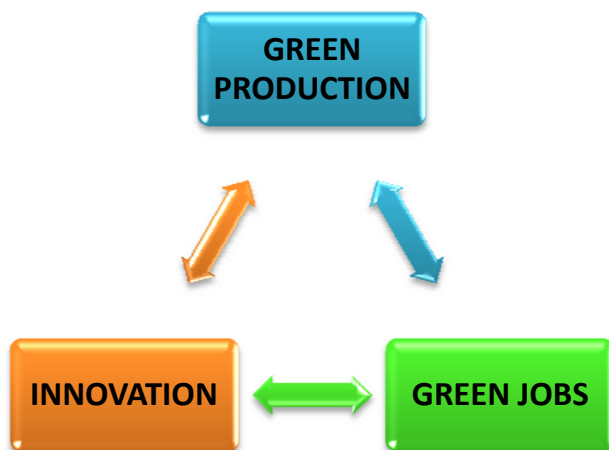
Of course that this is a result, more than anything else, of an association of complicities between gray production (headed towards economic growth, far from the sustainable approach) and consumer's behavior, that is usually unfaithful to the environment and totally loyal to its own personal benefit in market conditions: food, health, house, among other satisfiers. It is clear that we are fully capable of rationally maximizing the utility of these satisfiers, but also that we have systematically ignored the welfare of future generations. The challenge

¹ United Nations, *et al.* System of Environmental-Economic Accounting. Central Framework. 2012. Paragrahp 2.76.

² See "Se busca Trabajo Decente", of Amartya Sen.

is to find the path that allows satisfying our own needs but at the same time maximizing social benefit, thinking that welfare has elements that go beyond monetary benefits, such as human capacities, social contact, or freedom.

With this eagerness to relate processes, we also could find that it is not so simple talking about green jobs, but as a derivation of the production of environmental goods and services, as well as the innovation related to green production. Every production whose causa



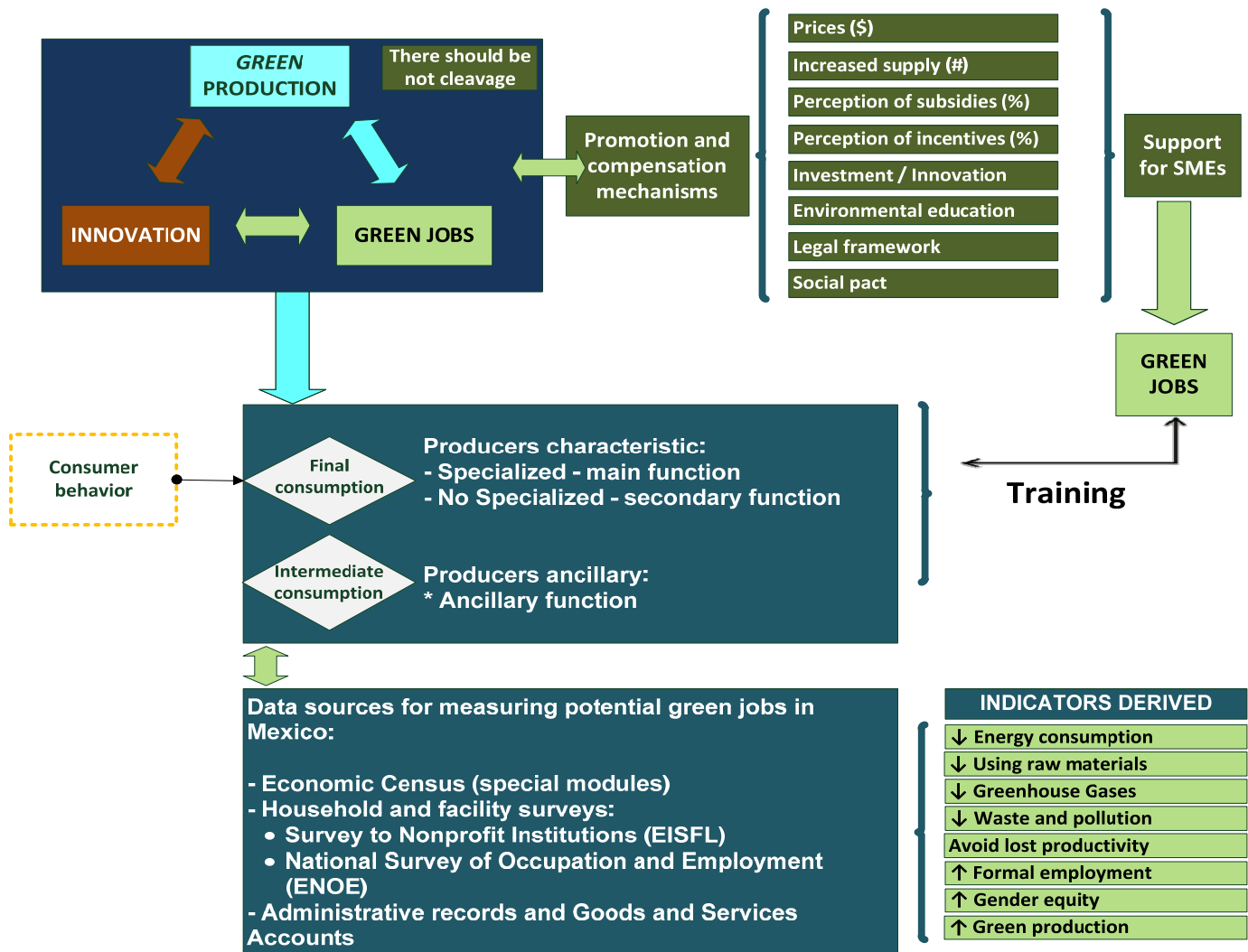
finalis consists in the protection, remediation, management, care or improvement of the environment necessarily generates green jobs. Even when the consumer of these goods and services does not necessarily have an agenda painted green. The secondary production of goods and services with this same nuance that are destined to other establishment or institutional unit also produces this kind of employments. Likewise, the auxiliary production of environmental goods and services different to generate savings or making the most efficient productive process, even when consumed by the same establishment, also generates the same kind of employments.

This is the heavy reason that obliges us to think that the ethos, personality, identification or character of the green jobs are not behind the consideration of just decent employment, education or health, but is also closely linked to green production and innovation. A detailed revision of the SEEA Central Framework (international statistic standard) leads us to find that the integration of economic and environmental information with the estimations of employment, population, health and education, allows to exceedingly enriching the sector analysis (paragraph 2.75).

The impulse and development of both clean production and technological innovation will have as a logical consequence the creation of specialized job positions focused on the protection of the environment.

The developed employments can be new, or an extension of the technical capacities of the workers through staff training. In such sense, green production can be seen as a source of employment generation and as an instrument of extension of the capacities of the staff that already belongs to the productive plant.

General Scheme



It is not omitted pointing out that the idea of green or clean production must be understood as that which is made maximizing the productivity of natural resources used through the whole production chain. This does not mean that the green production term is related with the idea of not using natural resources, but on the contrary, of using them but in a reasonable manner.

Mechanisms of promotion and compensation

In this work outline must also be considered the importance of compensation mechanisms, which allow consolidating or promoting clean production as a reality. It is clear that, as long as the supply of green goods and services as well as technological innovation for this ends do not have the conditions to compete in market terms with gray production, both producers and consumers will have to make conditional their participation to some kind of compensation with the purpose of maintaining their level of satisfaction and welfare.

On the producer's side, the incentive may have place through taxes, subsidies or fiscal regime exemptions that minimize their production costs. Other measures may emerge by partially assuming the cost of the inputs, supporting consumers with a price differential, etc., with the intention of staying in competition conditions in the traditional market, or at least until the green innovation allows reducing costs to competitive levels.

In this way, if we want to find data on the generation of green jobs, it is imperative to seek in the administrative records and publications on economic activities such as sustainable transportation, environmentally friendly construction, vehicle manufacturing with low CO₂ emissions, cement and paper production that uses recycled inputs, among others.

According to Mexico's experience in the establishment of the SEEA, and particularly of the environmental expenditure account, it is suggested to put special attention to the development of technical capabilities, that is to say considering the teaching activities, professionalization and training related to the natural environment, which surely also offer a range of employments among which are included green jobs. As a matter of fact, the vision of the ILO on the promotion of this kind of employments, and particularly of those that are related with the formal sector of the economy, will result in a bigger field of action for the statistics, because "...a greener economy will experience the emergence of new occupations, but in most cases will

require of new competencies in the existing works and changes in employment demand”³.

Green Jobs

As was mentioned, the special consideration for the measurement of the jobs at hand, is the fact that a big part of financial and non-financial societies, governmental dependencies and NPO, do not generally count with the identification of the number of workers that make “green activities”, because the workers that make this kind of actions, may also do another kind of tasks unconnected to the environmental boundary.

Let’s say that the immediate guide to start the process could find a good backing in the handbook of environmental-economic accounting, (known as SEEA, in its most recent 2012 version), which defines environmental activities as those made by economic agents to prevent, reduce or eliminate pollution, as well as any other degradation; or else, those whose final cause is preserving and maintaining the stock of natural resources and therefore protecting it against its depletion⁴. Additionally, it is important to consider in its delimitation the activities detailed in the Classification of Environmental Activities (CEA, Table 1), included in the SEEA, which would allow to complement the rows that are considered by the International Labour Organization⁵.

³ ILO (2012)/ Trabajando Hacia un Desarrollo Sostenible: Oportunidades para el trabajo decente y la inclusión social en una economía verde.

⁴ *Op. cit.* Chapter 4: “Environmental activity accounts and related flows”. pág. 88.

⁵ ILO-UNEP. Empleos verdes: Hacia el trabajo decente en un mundo sostenible bajo en carbono, (2008). “The work in agriculture, manufacture, research and development (R + D), the administrative and service activities that substantially contribute to preserve or restore environmental quality. In particular, but not exclusively, this includes jobs that help protecting the ecosystems and biodiversity, reducing energy, materials and water consumption through high efficiency strategies, decarbonization of the economy and reducing at its minimum or completely avoiding the generation of all types of residues and pollution”.

Table 1. Classification of Environmental Activities

Group	Classes
I: Environmental Protection (EP)	1 Protection of ambient air and climate 2 Wastewater management 3 Waste management 4 Protection and remediation of soil, groundwater and surface water 5 Noise and vibration abatement (excluding workplace protection) 6 Protection of biodiversity and landscapes 7 Protection against radiation (excluding external safety) 8 Research and development for environmental protection 9 Other environmental protection activities
II: Resource Management (RM)	10 Management of mineral and energy resources 11 Management of timber resources 12 Management of aquatic resources 13 Management of other biological resources (excl. timber and aquatic resources) 14 Management of water resources 15 Research and development activities for resource management 16 Other resource management activities

Source: SEEA. Central Framework, 2012. Chapter 4: Environmental activity accounts and related flows. pg. 91.

Types of producers

The incorporation of conceptual elements that derive from the different manuals related to environmental accounting is a factor that cannot be left out, at the margin of technical elements that may provide the particular approaches on satellite accounts.

In this sense, it is possible to define the characteristic activities of clean production such as those made by agents whose main function (specialized producers) or secondary (non-specialized producers) is the care of the environment, the combat and reduction of pollution, as well as the care of natural resources.

Table 2. Green Production by activity and producer

Green Production			
Final consumption			Intermediate consumption
Principal activities			Ancillary activities (GG., societies, NPI)
Specialized producers		No specialized producers (GG., Societies, NPI)	
GG, NPI	Societies, households		
<ul style="list-style-type: none"> • Environmental management • Renewable energy • Innovation • Recycling • Saving resources • Treatment • Reducing emissions <p>Examples: Ministries of environment and ecology Agencies that treat wastewater Entities producing clean energy</p>	<ul style="list-style-type: none"> • Renewable energy • Innovation • Recycling • Saving resources • Treatment • Reducing emissions <p>Examples: Recyclers Waste treatment and residual water companies</p>	<p>Invests and produces as secondary activities:</p> <ul style="list-style-type: none"> • Renewable energy • Innovation • Recycling • Saving resources • Treatment • Reducing emissions <p>Examples: Water Agencies (sewer) Companies that recycle as secondary activity</p>	<p>Protection activities conducted as part of the production process, purchased services, supplies produce for their own use</p> <p>Examples: Companies buying the waste treatment service Companies pay for the service of renewable energy</p>

Source: Authors.

On the other side, if the activities for the protection of the environment and the care of natural resources are auxiliary activities, meaning that they are part of the intermediate consumption of the production, they can be considered as non-characteristic activities or to support the environmental sector. Among the producers of specialized services we can mention the recycling or wastewater treatment companies. As an example of non-specialized producers we can mention the generation and sale of clean energy by establishments with other main activity, or the sewer system in charge of the water operation organisms. As an example of non-characteristic producers (second level related) we can mention those establishments that make environmental protection activities as part of their productive process, without those activities being their main focus, for example an industrial bread factory that recycles the residues of its processes, that treats wastewater for its reuse in the same productive process. Likewise, the

establishments that only acquire environmental goods and services as an input of their process are mentioned.

The basic idea is to put attention in the capabilities that persons may come to have, which depend both on the characteristics of the people and social opportunities. Between the capabilities that should be refreshed in people is the unrestricted respect to the environment, as an integral part of their education; considered an important capability.

(Amartya Sen, Joseph Stiglitz, Imanol Zubero)

The identification of green jobs must consider in first instance all the Government staff, NPO, private companies or producing households that are part of the specialized producers. In this case the Director, the technical employees, administrative staff, chauffeurs, etcetera, would have to be considered in the measurement because as a group they gather efforts for the causa finalis of supporting the environment and natural resources; such is the case of the Ministries of environment or Ecology Institutes, enterprises and organizations in charge of the collection and treatment of wastewater and solid residues, to mention a few.

In second place it would be included in the measurement the staff that participates in secondary activities (non-specialized producers). We are aware that not all the workers associated to these producers should be included, but a percentage of the staff dedicated exclusively to the secondary function for environmental protection or resource management should, that includes other strategic actions against climate change, such as the reduction of emissions to the atmosphere.

Finally, we should include all those workers (totally or partially) that make auxiliary activities as part of the intermediate consumption of the productive process, that is to say the employees that participate in the recycling of wastewater or solid residues and that serve as inputs to generate new products of the same company.

Possible sources of information for the measurement of green jobs

An important part for the measurement of green jobs is to know with which information we count to start this task. In this sense, there can be enlisted some sources like economical census, surveys on employment and occupation, time use, or special modules

that complement the existing sources. In Mexico, as a part of the 2009 Economical Census it was included a special section to know the total amount expended in environmental protection activities, as well as the number of dependent and non-dependent employees of the corporate name dedicated to make said activities.

Economical Census

Next is shown an example of the use of the available sources of information like the Questionnaire for the Water Operation Organisms that make the activity of Collection, Supply and Treatment of Water, that offers information associated to the number and type of workers (workers, administrative, men, women, etc.) with which the water operation organisms count, the hours worked and the remunerations paid (Tables 3.1 y 3.2).

Table 3.1. Employees and hours worked in the Water Agencies

		Agencies						2,517	
Corporate		No name-dependent		Provided by another name		For unpaid commission basis			
Employees		Employees		Employees		Employees			
Type	Number	Hours	Number	Hours	Number	Hours	Number	Hours	
Total	107,301	249,058	2,737	4,844	1,453	2,881	1,284	1,963	
Labor	63,110	152,203							
Technical st	12,238	28,539							
Administrat	23,445	51,728							
Managers	4,293	9,723							
Other	4,215	6,865							

Source: Based on data from the 2009 Economic Census.

Table 3.2. Remunerations employees associated to Water Agencies

Agencies	2,517
Remunerations (Billion of pesos)	11,675,175
Wages and salaries	9,506,162
Social benefits	2,135,118
Utilities workers spread	33,895

Source: Based on data from the 2009 Economic Census.

National Survey of Occupation and Employment (ENOE)

The ENOE is the result of an integral evaluation of many years, during which the National Institute of Statistics and Geography (INEGI) has carried out a series of activities of conceptual, methodological and improvement of processes character, with the aim of presenting a survey that allows to grasp and know in a better way the characteristics of the Mexican labor market, as well as the independent work and multi-occupation. This survey also allows capturing information related to the characteristics of the employing economic unit, number of employees, as well as the type of products that are elaborated or the services lent.

Survey to Non Profit Organizations (ENISFL)

Following with the surveys topic, in the frame of satellite accounting, Mexico has generated the Survey to Non Profit Organizations (ENISFL), basically applied to the producing establishments.

The International Classification of the Non Profit Organizations (ICNPO) suggests identifying inside the survey the group 5 information "Environment", referring to those organizations that promote programs of clean air, clean water, reduction and prevention of sound pollution, radiation control, dangerous waste treatment, and toxic substances, management and recycling of solid residues; conservation and preservation of natural resources, including soil resources and water resources, energetic and vegetal, for the use and general enjoyment of the population; environmental beautification and outdoor spaces as well as services of protection and welfare for the animals; comprehends refuges for animals and humanitarian societies; preservation and protection of the wild flora and fauna, comprehends sanctuaries and refuges; and finally veterinarian services such as hospitals and services for animals that attend farm and domestic animals and pets.

Table 4. Employees^{1/} of Institutions Private Nonprofit by functional classification, 2010

ICNPO group ^{2/}	(Units)	
	Paid employees	Volunteers
5 Environment	956	8,246

^{1/}Include volunteers.

^{2/}International classification of nonprofit organizations.

Source: Based on data from the ENISFL

Even when the information of this group is not presented disaggregated in the result tables of the Satellite Account for Non Profit Organizations (CSISFLM), given the statistical precisions; it is a good platform for the previously specified ends.

Derived indicators

Finally it is shared a brief list with some families of derived indicators that may result from the generation of these statistics, besides those that result from the environmental accounts, particularly of the topic of environmental protection expenditure:

- Green production / Gray production
- Green jobs / Gray jobs
- Green Growth Indicators
- Green jobs by sex