



Journal of Management

Print ISSN: 0120-4645 / E-ISSN: 2256-5078 / Short name: cuad.adm.

Pages: 176-189 / Vol: 36 / Issue: 68 / Sep. - Dec. 2020

Faculty of Administration Sciences / Universidad del Valle / Cali - Colombia

Current challenges of social function of accounting*

Retos actuales de la función social de la contabilidad

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Reflection Article

Submitted: 30/04/2019

Reviewed: 04/12/2019

Accepted: 07/04/2020

Thematic lines: Accounting,

JEL classification: M41, Q56

DOI: <https://doi.org/10.25100/cdea.v36i68.7893>

Abstract

The current accounting model measures the results of operations and what it considers are the costs and expenses associated with the productive activity at organizations, but it does not consider numerous negative externalities that actors of economic activities have been generating, such as extractive processes. Accounting that incorporates these negative effects into its accounts is what could be called social accounting, which differs from corporate social responsibility, the social balance sheet and environmental accounting, although they are related. However, there are those who have proposed changes to the current accounting model, trying to present the positive scope of this incorporation, aimed at its conceptualization as a "true benefit" as stated by BELKAOUL (2004). With the aim of seeking an opening towards a social accounting model, the purpose of this article is to determine possible social costs, and models of financial statements for social accounting, aware that, if the State does not establish the accounting regulations for these aspects, this type of project will not take on legal life. Therefore, we want to discuss with the academic community, in order to consolidate and propose its regulation to the State. It should be noted that multiple costs that cause both economic and social damage and moral damage to the population will be left out of the matrixes presented which could be considered in subsequent research that will require greater interdisciplinarity.

Keywords: Social accounting, Social balance, Sustainability, Environmental accounts and accounting.

Resumen

El modelo contable actual mide los resultados de las operaciones y lo que considera son los costos y gastos asociados a la actividad productiva de las organizaciones. Pero, él no recoge innumerables externalidades negativas, que actores de las actividades económicas han estado generando, como son los procesos extractivos. Una contabilidad que incorpore dentro de sus cuentas estos efectos negativos, es lo que podría llamarse contabilidad social, que difiere de la Responsabilidad social empresarial, del balance social y de la contabilidad ambiental, aunque estén

* This reflection article discusses the need to include in accounting reports the quantification of the damage caused to society and the environment, due to irresponsible practices by organizations.

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relacionadas. No obstante, hay quienes han propuesto modificaciones al modelo contable actual, tratando de presentar el alcance positivo de esta incorporación, dirigida a su conceptualización como un “beneficio verdadero” tal como afirma BELKAOUL (2004). Con el objetivo de buscar una apertura hacia un modelo de contabilidad social, el fin de este artículo es determinar posibles costos sociales, y modelos de estados financieros para una contabilidad social, conscientes que, si el Estado no establece la normatividad contable de estos aspectos, este tipo de proyectos no cobrarán vida jurídica. Por ello se desea discutir con la comunidad académica, con el fin de consolidar y plantear al Estado su regulación. Conviene advertir que quedarán por fuera de las matrices presentadas, múltiples costos que causan perjuicios tanto económicos como sociales, y daños morales a la población, que podrían ser tratados en posteriores investigaciones que requerirán de una mayor interdisciplinariedad.

Palabras clave: Contabilidad social, Balance social, Sostenibilidad, Cuentas y contabilidad medioambientales.

1. Introduction

Accounting has been characterized because it has always tried to adapt to the information needs that economic and state entities have had. Faced with the social alterations that some economic actors have been causing in the development of production activities, both the agents involved and the academic and non-academic communities have assumed leading roles in the discussion about the need to create accounting that collects within its schemes the costs generated by damages of a social nature.

That is what we could call social accounting; “The valuation of natural resources is an essential input both in the analysis of social cost-benefit, and in some approaches to environmental accounting” (2017). This piece of work leads precisely to the proposal of an accounting and cost model that recognizes and presents social and environmental costs.

2. Theoretical framework

2.1. Social function of accounting (a historical review)

There are economic variables used since ancient times, which represent an accounting platform, such as interest rate, indebtedness,

fees, investment and other more modern ones such as present value, rate of return, profitability, future value, cash flows, among many. If all of them are framed within a society, it is required legislation and responsible actions around them. One of these variables that has been repeatedly recorded and on which there has been clear legislation over time and across different people and cultures, has been the interest rate.

The concept of “interest” and the legislation on it is reiterative: Records have been found in the Vedic texts of India dating back to 2000 and 1400 BC where practices of loans in exchange for interest are described; Also in various biblical quotations from Old Testament books such as Leviticus 25:36 and in the Deuteronomy 23:20 there is legislation on interest, the amounts to be paid and on not exceeding certain limits. The aforementioned quotes are part of representative books of the Old Testament, which for a long time were the Constitution of Jewish people, therefore, they were laws for them which leads to deduce that the recognition of the subject of interests in these books is part of the first accounting legislation of which there is reference (Castrillón and Castrillón, 2009).

By the end of the Roman Empire, the Emperor Justinian, in his eagerness to link religion and State, taking biblical indications as a point of reference, made various and numerous decisions, including that of regulating interest rates, setting a limit (Digesto, 22, 1.29 and 42, 1.27; Codex, book IV, Title XXXII, num 28). All of the above reveals that in these communities, since then, there has been an account platform and reason where, in its own way, accounting was kept that satisfied the need to have in a timely manner or when required, data related to interest rates, loan amounts, terms, installments, due dates, balances and defaulting debtors, etc. Giuseppe Cerboni, at the end of the 19th century, stated that accounting must consider, before the economic activity of the company, the acts of its administrative bodies, in order to exercise control over them and defined Accounting as “the science of functions, responsibilities and administrative accounts of the finances” and that includes four different parts that deal with respectively: The study of functions of company economic administration; the

organization and internal discipline of companies; calculation, that is, the application of mathematics to administrative facts and their demonstration in tabular order and finally, the study of the recording method (Tua, 2004). After analyzing the definition provided by Cerboni and other accounting definitions, we find that it is frequently defined considering the processes it performs and the object on which it reports. In fact, accounting must provide enough information that serves the purposes of making decisions and controlling, since, if the information is clear, timely, impartial and complies with the standards that have been assigned as its own, there are enough elements to make decisions and exercise control.

On the other hand, a widely extended theory today, considers accounting as a technical and objective means of “representation” of the “organizational and economic reality” (Mattessich, 1964). According to this conception, accounting, its disciplinary fields and technical and technological tools (such as financial reports, management accounting systems, strategic accounting, financial auditing, environmental accounting, social accounting, etc.), are seen as processes and archetypes that seek to “represent” or report the economic reality in organizations and markets (Coase, 1990) and (Sunder, 1997, 2002); These instruments must also describe social, environmental and ecological realities.

According to this responsibility, accounting cannot be separated from ethical and moral frameworks. Biocentrism, which is a philosophical theory that confers moral relevance to living beings (humans or other species), with the right to have their existence and their contribution to sustainability respected, supports the motive and validity of environmental ethics, and justifies the commitment to account natural resources used by the entities, and its impact on sustainable development and standard of living. (Ladino and Ramírez, 2018). However, the ideas of ethical regulation in accounting go back to Greece, and it is Aristotle, who in his texts alludes to the dual concept of justice: On the one hand, the commutative corrective, applicable to business, and on the other, the distributive, applicable to wealth, since it is the type of justice that seeks the right balance between the gain of one and the loss

of the other. In this search, accounting would become a probative means of the damages caused in business processes (Franco, 2014), so that the obligations acquired explicitly or implicitly, are recognized, processed and reported for accounting, which requires them to be expressed or quantified to an extent that is considered real or true.

2.2. Measurement and valuation in the accounting representation of reality

Since accounting makes it possible to define and assign the decision-making rights to agents, it helps to build mechanisms for evaluating and monitoring decisions, as well as helping to develop incentive and remuneration schemes; it also makes it possible for agent contributions to be accurately measured and for the rights of each participant to be measured and distributed. (Gómez, 2009). It is necessary to address the fundamental concepts of measurement and valuation in the construction of a model of financial statements for social accounting. In this regard, García, Franco and Agudelo (2016) state that the foundation of accounting measurement is material reality (wealth), while accounting valuation must be based on social reality for the protection of public interest. The measurement framework, so much in the western spirit, has allowed monetary measurement to be taken in institutional order (for accounting purposes) and the code to be assumed without discussion of its origin, relevance and effect.

Hence, precisely the accounting representations that seek to simplify reality, involve metric processes that synthesize reality on a scale, to make it knowable, identifiable, distinguishable, instrumentalizable and thus be able to handle it in the different accounting methodologies. The concepts of price, value and capital, in some way compete with accounting in its function of measuring, valuing and reporting wealth. The classic concept of “value” is derived from moral philosophy, and expresses the notion of human nature, including nature in general, which came to prevail in early modern times. Referring to the “natural” is not related to a condition given by a “divine” or human nature, but by the biological, physiological and functional character. This means that a

“natural resource” is a “resource”, not only if it is scarce, but because it is necessary and / or essential for human functioning.

This is how the attribute or quality of value must be given to each entity, animate or inanimate, living or inorganic, by reason of its function for what it is created and not only by the use that can be given to it. For example, river water is vital to a community, although it may be useful for building a hydroelectric dam or for extracting oil. These latter attributes are not natural to it, therefore, their value should not be assessed for those functions. Regarding the “price”, this arose when the equivalence of the goods, in currencies, was sought. Price is, then, a more tangible unit of measure and less subjective than others, since it is numerical; However, the search for the “fair price” advocated by church during the medieval period shows that the concept “price” is still a “mental” concept of the whole community, involving ethical questions and that it has two very different related aspects: A pattern and a moral quality of destiny, as a proverb says: “In life you can only buy what has a price; what has value, will have to be captivated.

For Ayres (1962), the notion of capital itself, like the idea of price system, has a commercial origin in the sense of being a symbol of the structure of commercial society; it is money that has been “invested” in tools and materials. In the approach based on the work “Ragioneria”, which develops the thought of Fabio Besta (2007), every material magnitude that can be measured and expressed in monetary value is the object of account. Codes and criteria of this representation have implied monetary-financial simplification. A currency is, precisely, a representative sign of the price of things and services (Quillet, vol.6to.). This approach leads to accounting representation of reality means that there must be correspondence between what exists and what is represented. Baudrillard (1981) calls “deep reality” when the representation is true and transparent. Such correspondence is necessary for control of wealth.

The aforementioned simplification criteria, in which the accounting representation of the existence of a good, is in an account, whose amount has been objectively measured in monetary terms, for a price (historical

cost), are counteracted in the application of current accounting regulations, for example, in what they have to do with the valuation of the accounting result, when there are measurements at fair value regulated in the International Financial Reporting Standard no. 13.

2.3. Social accounting: Background and importance

During the 19th century and the first half of the 20th century, companies as such “on their own initiative” tried to solve social problems that were presented to them. Later, companies began to assume the responsibility of participating in the welfare of society with actions in favor of their workers and support to the community, but these were specific philanthropic activities. Starting in the second half of the 20th century, community began to become aware of the capacity of private sector to influence and solve social problems, by recognizing the damages and risks that its activity caused to environment. At this stage, the state begins to intervene with regulations that protect public interests and natural resources.

Hence, social actions of the private sector complement what the state does in this regard. Also in this period, social sensitivity to ethical issues arose and a constant social concern about business ethics emerged. Since the 1960s, the concept of “corporate social responsibility” had begun to be mentioned in the United States, which can be defined as the active and voluntary contribution to social, economic and environmental improvement by companies. Explorations in relation to corporate social responsibility brought with them the use of a new vocabulary, which included terms such as social auditing, social performance, social disclosure and accountability. During the second decade of the 20th century, some organizations decided to publish and publicize their programs through the publication of social reports or the social balance sheet, which constitutes a mechanism created for companies to account for the impacts of their actions on the social area.

Regarding this, Professor Austin (Dinero 2000, p. 65) from Harvard Business School,

cited by Correa (2007. p.90) said: “we have gone from a traditional philanthropy, in which a check was made for those who came to ask for, to a relationship in which companies and non-governmental organizations begin to think about how they can interact to generate added value and social impact in the country or the community”. In Social Balance, favorable and unfavorable results for society are compiled, which are derived from the intervention of the company. Although these balance sheets are intended to cover more than financial information, in them the “social” is an appendix to the financial information that is not integrated into the operating economic results. Social benefits that are reported show the actions carried out by the company for the benefit of the community, internal or external to the organization, as a voluntary gesture of generosity and sometimes hide the interest in avoiding sanctions. On the other hand, social costs reported in the company’s social balance sheets do not punish the operating result, nor discourage the execution of an irresponsible (or unsustainable) activity, as long as the costs of said activity are lower than the profits obtained and / or, those same profits can cover possible sanctions.

Another attempt for accounting to report on social issues is “The Triple Bottom Line”. The term refers to sustainable businesses, whose performance must be expressed in three dimensions: social, economic and environmental. Currently its preparation and publication is voluntary throughout the world, and there are documented cases such as those mentioned in the book by authors Andrew and Savitzky (2013). As an important local contribution to the development of social accounting, we can mention that, in Colombia, a group of accounting academics has used the term “Three-dimensional accounting theory” T3C (Mejía, Montes and Mora, 2013), which proposes that accounting does not only measure the performance and / or results of organizations.

The T3C is a proposal for the general structure of accounting that is established from the recognition of the existence of three dimensions of reality: environmental, social and economic. It also proposes that the function of accounting is to evaluate the management that the organization exercises

over the wealth it controls, which can be environmental, social and economic (Mejía, Montilla, Montes and Mora, 2014). Both the T3C, the TBL and / or CSR, can contribute to the achievement of strategic objectives by being used as a “differentiator” from other companies in the environment, achieving through these social reports, publicity and recognition. The relation between social / environmental and financial performance imposes new challenges on accounting with regard to information needs, which today have changed; Thus, in addition to the rigid accounting standards, there are information needs that are not covered by traditional accounting statements.

However, accounting must be able to measure (quantify) not only purely economic magnitudes, but also social facts. It is necessary to think about accounting systems that, making use of the methodologies of accounting, interdisciplinarity with social sciences and, why not, with natural sciences, measure and record the data that positively and negatively affect society. Many forms of exploitation and degradation of the environment, such as highly polluting mining, can not only destroy local subsistence resources but also social capacities that have allowed a way of life that has long conferred cultural identity (Vaca and Ramírez, 2018), however, in accounting reports, where do the costs of events such as contamination to water currents, decrease in fishing, the impact on a number of families that may have had to move from the extraction areas appear? What is the cost of this displacement in terms of the migration of the economic activity of the displaced family in search of other income sources?

As Vaca and Ramírez (2018) indicate, the disappearance of some culture can be as serious or more serious than the disappearance of an animal or plant species. Similarly, when a family moves to a new settlement, it affects the socioeconomic context to which it arrives, almost always negatively. This is a high cost, which, like others, is not quantified. It should be clarified that when the consumer perceives that a company is socially responsible and with ethical responsibility, they prefer their products over others of the competition. Some authors such as Orlitzky, Schmidt and Rynes,

(2003) find that there is a direct relation between social / environmental and financial performance, it should be noted that the concept of social accounting goes beyond the limits of discourses full of good intentions, and from the context of scientific knowledge, it is a branch of financial accounting, productive in answers to the accounting of social problems in their aspects of causes, manifestations and projections.

For this reason, social accounting should be seen not simply as a concept that reacts to the traditional, but as the opportunity to create new spaces that allow the use of new accounts that go beyond the economic, capable of responding to community concerns, to cultivate social awareness in the state apparatus and in private organizations.

3. Model of how to measure and value social cost in accounting

3.1. Methodology

One of the objectives of the work is to propose to the accounting academic community, a way to measure certain social costs, typical of carrying out an industrial economic activity, so that they are incorporated into the income statement of the entity that generates them and the economic impact of those variables is reflected in the operational result, which in the social balance have been identified as social costs. In this context, this piece of work is classified as correlational transectional / causal, since it will describe the relation between social costs and the economic operational result of a company, at a specific time. For the construction of the proposed model in this article, technical measurement criteria used in accounting and other disciplines such as biology, physics, engineering and economics have been taken into account. These criteria are: historical cost, accounting estimates, cost of opportunity, cause-effect models for the evaluation of impacts on the Environment (Leopold's Matrix) and the Technical Manual of economic evaluation of environmental impacts in projects subject to environmental licensing by the Colombian Ministry of Environment, Housing and Territorial Development.

3.2. Matrix description

Taking the typology of environmental impact measurements as a basis (Leopoldo's matrix), the environmental factors considered by the competent bodies are:

- Man, flora and fauna.
- Soil, water, air, climate, and landscape.
- Material goods and cultural heritage.

In the upper part of Table 1 (first row) elements that can be modified by humans in the exercise of an economic (industrial) activity are mentioned. These modifications can be large and cause serious problems, generally difficult to assess, or minor problems easily remedied. The left column lists the processes necessary to reverse or reduce the negative impact on different elements.

The processes proposed to be cost are:

Water purification: Remove from it what dirties, damages or contaminates it so that it remains in a state of purity or cleanliness.

Decontamination: Action carried out through different processes either in physical or chemical form to reduce or cancel the polluting effects of those materials that produce them or that have been accidentally contaminated. There may be olfactory, auditory, or visual contamination.

Bioremediation: Any process that uses microorganisms, fungi, plants or the enzymes derived from them to return an environment altered by pollutants to its natural condition.

Phytoremediation: Set of methods to break down, assimilate, metabolize or detoxify heavy metals and organic compounds through the use of plants.

Reforestation: Operation in the field of forestry aimed at repopulating areas that in the recent historical past (usually 50 years) were covered with forests that have been eliminated for various reasons.

Repopulation: Artificial methods to reverse the decline in resources include repopulation and habitat restoration programs, designed to reinforce wild populations of endangered species with captive-bred individuals.

Table 1. Matrix impacted environmental factors and corrective processes

Element	Water			Soil			Ecosystem			Fauna			Total per process	
	Individual value	Volume	Total	Individual value	Volume	Total	Flora	Ind. Val.	Qty.	Total	Ind. Val.	Qty.		Total
Process		Qty.	Unit meas.		Qty.	Unit meas.		Ind. Val.	Qty.	Total	Ind. Val.	Qty.	Total	
Purification			M3			\$ 0								\$ 0
Decontamination														\$ 0
Bioremediation					Ha/year	\$ 0								\$ 0
Repopulation													\$ 0	\$ 0
Corrective action on impacts														
Reforestation					Ha/year	\$ 0								\$ 0
Total 1						\$ 0				\$ 0			\$ 0	\$ 0
Damage to the population														
Item	Individual value	# hours.	Total	Individual value	# hours.	Total	Individual value	# hours.	Total	Individual value	# hours.	Total	Total per item	
Morbidity/mortality														
DISPLACEMENT/ economic activity													\$ 0	
Housing													\$ 0	
Security													\$ 0	
Economic deterioration													\$ 0	
Total 2			\$ 0			\$ 0			\$ -			\$ 0	\$ 0	\$ 0
Grand total													\$ 0	\$ 0

Source: Authors' own elaboration.

The row "TOTAL 1" allows to know how much it costs the company to carry out the different types of processes, totaled for each element (vertical summation) and for each process (horizontal sum). Each company, depending on its activity and the damage it causes, will carry out the relevant processes, so it is possible that not all of them will have to be paid for or that other processes not described in this study will be carried out. In the model, the values of "TOTAL 1" on the matrix must be assumed by the company, either by executing the processes itself, or with the payment of a "Compensation for social costs" to the nation. If the companies causing the damages execute the corrective processes or pay the state the "compensation for social costs", for it to carry them out, they will not have to assume the costs of the damages to the population, which are shown in row "TOTAL 2" of the matrix, since these are avoided by carrying out the processes of "TOTAL 1." Otherwise, it will have to assume the social costs for damage to population, among which it is suggested to pay:

Morbidity: Number of people who fall ill in a given place and period of time, in relation to the total population.

Mortality: Number of people who die in a place and in a given period of time, in relation to the total population.

To ascribe costs to these concepts, it is suggested to consult the Technical Manual for economic evaluation of environmental impacts in projects subject to environmental licensing, of the Ministry of the Environment, Housing and Territorial Development -Directorate of Environmental Licenses, Permits and Procedures-

Displacement and Marginal Economic Deterioration: The first occurs when, due to an economic activity that is not socially responsible, families face the loss of their source of livelihood, as well as the deterioration of their standard of living and this forces them to move to other communities. The second, defined as the cost that those communities not directly affected by the economic activity of the company have to bear, but they receive indirect effects due to the displacement of many of their exchange agents. In addition to an economic

impact, displacement alters cultural patterns of the communities, a situation that is beyond the scope of the proposed matrix, since evaluating the impact of culture on the economy, social cohesion and environmental balance of a territory is a complex task to be quantified (Vaca and Ramírez, 2018).

TOTAL 2 includes the economic damage caused to the population that could have been avoided. It is the consequent social cost of not bearing the costs of preventive and / or corrective activities that are summarized in TOTAL 1. Since each of the costs suggested in the matrix is transferred to the accounting model, some of these costs are measured at historical costs, that is, the corrective activity carried out by the company will be costed as one more process of production in the same period in which they are reported. For other costs that will be incurred later, it will be necessary to create provisions for risks and expenses, in the amount of the best possible estimate.

3.3. Suggested social and environmental accounts

It is proposed to use the accounts "social cost of exploitation" or "social expense of exploitation", in the situation in which the company itself carries out processes to avoid or rectify its impact on the elements: Purifies, decontaminates, bioremedies, etc. Thus it avoids displacement, morbidity, and economic deterioration of population. The effects of these costs in the financial statements are: in the income statement, "social operating costs" directly decrease its gross margin and an investment in own assets is required to, simultaneously with its extractive activity, carry out the processes. Now, if the repair activities were carried out in later periods, that is, they are not inherent to the activity of the period (For example, reforestation and bioremediation) are recorded in "social operating expenses" and a provision is created, using the matrix criteria, such as the best possible estimated cost.

In situation 2, the company pays for the damages caused. In this situation, the company does not need to make investments or incur costs or expenses to carry out the processes that affect its operating results,

but instead pays the state a “Compensation for social costs”. The expense is recorded and a provision is created, using the matrix criteria, such as the best possible estimated cost, since the company will pay for them at the end of the period. A third situation is the case of a company that does not take responsibility for the damage caused to environmental factors and society. The proposed matrix would help the authorities to assess the sanctions that would be imposed on the economic entity that ignores social costs, not as a percentage of profits or income, since this does not discourage irresponsible activity, but by the value itself (estimated) of those costs. These companies, although net profit will be affected, will not have the tax benefit on income tax, of complying with the payment of their affectations, as if the companies of situations 1 and 2 have it.

3.4. Matrix application

Table 2 shows the figures of the Mining Fictitious company, dedicated to the extraction of gold in a village of 1,000 inhabitants and an average of 200 homes, where its activity generates environmental and social effects. At the end of the year, it obtained operating income of \$ 4,637,695,000; extraction costs \$1,348,030,000 and operating expenses (administration and marketing) \$ 2,778,363,000; financial expenses amounted to \$ 79,099,000. Tax rate: 33%.

The open pit has an area of exploitation of 12 hectares. The exploitation is done with heavy machinery, lots of water and highly polluting chemicals, so the discharges that come out of the mine would contaminate the water currents that they encounter and destroy fauna. About 120 houses are in direct contact with the water currents and depend on the fauna of these currents, which would be decimated and poisoned by mining exploitation. In the remaining 80 households there would also be negative impacts generated by the exploitation, with a less severe effect. Due to the exploitation and use of lots of water, the lands are unusable, therefore, reforestation, bioremediation and repopulation would be necessary. To return the land to its natural state, the cost of bioremediation is estimated, the unit of measurement is that of bio-remediating

one hectare of land. Due to the damages generated in the planned exploitation, the 120 households near the water sources must move to urban centers, which generates a deterioration in the standard of living, the displaced in terms of employment, education and housing, in addition that they become potential factors of insecurity and violence.

On the other hand, Table 3. shows the models of income statements with the 3 possible situations proposed:

Situation 1: The company chooses to incorporate systems that correct in situ the polluting effects of its activity and assign reserves for later recoveries. To carry out subsequent processes such as reforestation, repopulation of fauna and bioremediation, among others, accounting reserves are created; These reserves are recorded versus “social operating expenses” and are presented in the income statement after profit or gross margin, before profit from ordinary operations. For this first situation of the case studied, it is considered that, in addition to the costs of the activity, the company carries out the following processes, which are classified as social operating costs: water purification, bioremediation (in the form of phytoremediation) of soil, repopulation of fauna and reforestation of land.

Regarding the purification process, for the cost matrix, the cost of water purification is \$ 2,067 per cubic meter. The value is calculated considering the service charge by the city water company in the company’s area of influence, assuming that operating the purification plant costs the Fictitious Company the same as paying for drinking water. If the Mining company must purify approximately 20,000 m³ of water during the year, the total cost for this concept is \$ 41,340,000 per year. The cost of bioremediation (phytoremediation) was determined as follows: The mining fictitious company was granted an equivalent exploitation area of 12 hectares and a period of time of 5 years, therefore, it will annually exploit 2.4 hectares in average. According to the study “Agrobiotecnología, curso 2011-Biorremediación” (Agrobiotechnology, course 2011-Bioremediation), prepared by Dr. Alejandro Mentaberry, of the Department of Physiology, Molecular and Cellular Biology, of

Table 2. Social Cost Matrix for a Hypothetical Corporation

ELEMENT	WATER				SOIL				ECOSYSTEM					
	INDIVIDUAL VALUE	VOLUME		TOTAL	INDIVIDUAL VALUE	VOLUME		TOTAL	FLORA		FAUNA		TOTAL PER PROCESS	
		QTY.	UNIT MEAS			QTY.	UNIT MEAS		IND. VAL.	QTY.	TOTAL	IND. VAL.		QTY.
PURIFICATION	\$2,067	20,000	M3	\$41,340,000	-								\$ 41,340,000	
Decontamination													\$ 0	
Bioremediation					\$7,500,000	2.4	Ha/year	\$18,000,000					\$ 18,000,000	
Repopulation											\$ 1,261,349	15	\$ 18,920,228	
Corrective action on impacts														
Reforestation					\$22,464,608	2.4	Ha/year	\$ 53,915,060					\$ 53,915,060	
TOTAL 1				\$41,340,000				\$71,915,060			\$ 0		\$ 18,920,228	
DAMAGE TO THE POPULATION														
ITEM	INDIVIDUAL VALUE	# HOUS.	TOTAL	INDIVIDUAL VALUE	# HOUS.	TOTAL	INDIVIDUAL VALUE	# HOUS.	TOTAL	INDIVIDUAL VALUE	# HOUS.	TOTAL	TOTAL PER ITEM	
MORBIDITY/ MORTALITY														
Displacement/ economic activity	\$ 828,616	1,440	\$ 1,193,207,040										\$ 1,193,207,040	
HOUSING				\$ 24,843,480	120	\$ 2,981,217,600							\$ 2,981,217,600	
SECURITY										\$ 2,423,252	60	\$ 145,395,134	\$ 145,395,134	
Economic deterioration							\$ 82,862	80	\$ 6,628,928				\$ 6,628,928	
TOTAL 2			\$ 1,193,207,040			\$ 2,981,217,600			\$ 6,628,928			\$ 145,395,134	\$ 4,326,448,702	
GRAND TOTAL													\$ 4,458,623,989	

Source: Authors' own elaboration.

Table 3. Income statements with social costs

FINANCIAL STATEMENT PROPOSAL			
HYPOTHETICAL MINING CORPORATION LLC			
P&L STATEMENT (by Function)			
January 1- December 31/20XX (in pesos)			
	SCENARIO 1	SCENARIO 2	SCENARIO 3
Revenue from ordinary activities	4,637,695,000	4,637,695,000	4,637,695,000
- Environmental costs of extraction	(41,340,000)		-
- Extraction and sales costs	(1,326,756,000)	(1,326,756,000)	(1,326,756,000)
Gross profit or loss	3,269,599,000	3,310,939,000	3,310,939,000
+Other ordinary operating revenue	-	-	-
- Operating expenses	(2,770,403,712)	(2,770,403,712)	(2,770,403,712)
Marketing expenses			
Management expenses			
- Environmental operating expenses	(90,835,288)	-	-
Net profit or loss from ordinary activities	408,360,000	540,535,288	540,535,288
+ Net P&L of funding	(79,099,000)	(79,099,000)	(79,099,000)
± Non-ordinary items			
+ Net earnings*	-	(132,175,288)	-
= Profit or loss before tax	329,261,000	329,261,000	461,436,288
- Income Tax (33%)	(108,656,000)	(108,656,000)	(152,274,000)
= income for the year	220,605,000	220,605,000	309,162,288
- Penalty for social costs and expenses			(4,458,624,000)
= NET EARNINGS	220,605,000	220,605,000	(4,149,461,713)

Source: Authors' own elaboration.

the Faculty of Exact and Natural Sciences of the University of Buenos Aires, the cost of the phytoremediation of a hectare of soil, 15 cm deep is US\$2,500, therefore, if we consider an exchange rate of \$3,000, this cost in the matrix is \$18,000,000 per year.

Among the bioremeasurement options, the phytoremediation process is chosen, since according to the aforementioned study it is effective in detoxifying the soils of contaminants from human activities such as mining. The advantages that phytoremediation offers compared to other bioremediation processes are: Low cost and

the speed with which certain degradative processes can be developed. In the restocking process (of fish), the most significant cost is that of the laborers in charge of the process of stocking fingerlings. The amount 15 in "fauna" column, is explained with 5 employees who work for 3 months. They earn one minimum legal monthly salary (smmlv), the difference between \$828,616 and the value of the smmlv (2019) and \$ 1,261,348, corresponds to social benefits and the estimated cost of the fingerlings. The value estimated by the authors is low, since, on occasions, through the Secretariat of Agriculture for Rural Development, for the

General System of Royalties, resources can be obtained to carry out this activity. For the parent company, the reforestation process is done specifically with Paulownia, considered the most profitable tree in the world, and which is already cultivated in the country. Agropaucol sells cuttings for cultivation per hectare, each of them costs \$4,500, that is, growing one hectare has an average value of \$4.5 million.

Situation 2: The company is aware of social and environmental damages generated by its activity, and pays the State the amount calculated for said damages, so that it is the one who takes the remedial actions, through competent authority. For the values calculated by these concepts, as in situation 2, accounting reserves are created for the future disbursement of those values. These reserves are recorded against a “compensation for social costs” account. The item is presented in the statement of income, after profit from ordinary operations. In both situations 1 and 2, the earnings before tax that were calculated will be the same. Scenario 2 is less desirable because, although the company is being responsible for paying the damage caused by its activity, there is a risk for the resources to not being invested in the corrective processes or that they would not be ultimately destined to the affected community.

Situation 3: The company does not consider in its costs and operating expenses those negative effects (social and / or ecological) that its activity generates; so that, since they are not measured by the causing company, costs and expenses being incurred, to recover caused damages, would be paid by society and the corresponding environmental authority that will set the amount, taking into account the ones that should have been paid and stopped paying to carry out its activity (TOTAL A) and the consequent social costs (TOTAL B) according to the measurement rates suggested in the model, such as: Those for 80 households that are not directly affected by the polluting activity by the company, these could have negative economic consequences due to the displacement of those 120 directly affected households to the extent that they will have to look for other sources of exchange

of products that they had with those 120 households. This impact is estimated at 10% of the 2019 SMMLV: \$82,862.

If the company in situation 3 does not avoid social damages, which add up to slightly more than \$ 4,000,000,000 (grand total of the parent company), how much is the true value added by the company to its environment? To profit after tax of \$309,162,442 those \$ 4,458,624,000 must be subtracted, the company has actually generated a loss close to this value, which society has assumed.

4. Conclusions

Accounting to respond to the demand of economic models has traditionally focused on an economic-financial aspect (financial accounting), however, today we face a world with great social and ecological challenges that affect society. The proposed social accounting model presents as recognized and measured environmental costs, those incurred in the processes to reverse, repair or mitigate the impact on the environment, and the economic damages caused to population, such as the consequent social cost of not assuming the costs of preventive and / or corrective processes.

This model includes a measurement of costs, accounts and financial statements that make it possible to make visible the actions carried out to correct the effect of aggressive practices on the environment of organizations and to assess that social damage caused. When analyzing income statements proposed for 3 situations raised in this paper, it is evident that, although the same figures are handled in the items that compose them, the presentation changes the meaning of the information reported.

The importance of this piece of work lies in making visible the costs that companies have for carrying out socially and environmentally responsible actions, and allows interpreting their level of commitment to it. Contrary to the position of Vikhanskiy, Churkina and Zaverskiy (2012) who argue that it is obsolete for companies to consider environmental protection as an additional cost to their activity, the authors of this article are sure that they are, to the extent that its occurrence

must be inherent to that activity; Moreover, if activities that undermine environmental factors were not carried out, there would be no need to incur costs to protect them.

The proposal to create and use accounts for “Social operating costs”, “social operating expenses” and “compensation for social costs” has a challenge to accounting, in charge of reporting transactions, which may become the subject of future research: To get equivalent units of measurement, capable of reflecting the value of social facts that cannot be assessed in price or, even if this were possible, without actually “reifying” what should not be taken to the quality of a material object. It is increasingly recognized that environmental policies generate benefits, among which we can mention the reduction of costs through energy savings, reduction on environmental fines and prevention of ecological risks, helping to create a positive image of the company among its stakeholders and help the company create a competitive advantage, the measurements of those benefits could be incorporated into a model in future pieces of work.

In this regard, the number of companies committed to carrying out socially and environmentally responsible actions is increasing, so the possibility of conducting case studies to apply the model in real companies is attractive, and allow them to make visible that they are complying with their responsibilities. It is certain that these models do not weigh the moral damages to the communities, the most important thing is that the interested parties (consumers, companies, managers, professionals of accounting sciences and the State, among others) acquire awareness that social accounting can constitute a strong support to sustainability of economic activities, that no cost is high to genuinely protect communities and that marketing benefits obtained by carrying out actions of social and environmental responsibility are accessories of what is really important: Taking care of air, water, flora and fauna, as vital means in here, our planet.

5. Conflict of interest

The authors declare no conflict of interest

6. Source of Financing

Research without sponsorship

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How to cite this paper?

Castrillón Cifuentes, J. A., & De León Cuesta, E. (2020). Current challenges of social function of accounting. *Cuadernos de Administración*, 36(68), 176-189. <https://doi.org/10.25100/cdea.v36i68.7893>

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