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TITLE OF THE PAPER: Measuring firm sustainability performance: Arriving at the right metrics

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Measuring firm sustainability performance:

Arriving at the right metrics

Abstract: *Sustainability Performance is a popular word for firms, which is highlighted for competitive advantage. Firms present their initiatives through various forms of quantitative reporting highlighting their efforts towards balancing the economic, social and environmental objectives. Many reporting metrics have been developed though this has not been standardized so far. Measurement metrics of firm performance in terms of sustainability varies within researchers and organizations based on evaluation objective. This paper makes an effort to understand sustainability through ancient and current literature, firm performance and growth. It also compiles the metrics for sustainability performance, tries to modify and add few more possible parameters for measurement while focusing on value based approach and proposes new set of metrics for performance measurement.*

Keywords: Sustainability performance, degrowth, measurement metrics, cooperation

We live in a world of uncertainty, though we are always eager to know what is in store for us in the future. From early civilization, scientists are engaged in different forms of research to make an estimate of future occurrences. While technological advancements make human life easier, the insecurity in future in terms of earth not supporting the population through adequate resources has prompted social scientists to work on sustainability issues. Industrial growth ensure sufficiency in manufactured items but in the competition to stay ahead of others, firms generally overlook social and environmental aspects which might squeeze the natural resource supply for the future generations.

Population and resources follow different path of growth which prompted Malthus to develop theory of population where he predicted a catastrophe in few decades. Though the predictions have not come true as of now, but the industrial growth and consumption pattern of exponentially growing population tends to lead towards such a phenomena. Politicians, Scientists, Environment activists all have been discussing, formulating and modifying strategy for sustainable development to avoid this crisis. Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. The concept of sustainable development does imply limits - not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities. But technology and social organization can be both managed and improved to make way for a new era of economic growth (World Commission on Environment and Development, 1987). Now a day's people in corporate sector try to include the word sustainability in every initiative they take in terms of procurement, production, human resources management and marketing. Many use this word as a marketing tool to make customer feel good about the purchase from a company championing the Sustainability cause. The objective of this paper is to get a better understanding of sustainable development through current propositions and citations from ancient literature. It also approaches various possible ways for measurement of sustainability performance by firms. We now look at some concepts which are popular in terms of approach to sustainability.

Deep Ecology

We have been using, abusing and exploiting resources provided to us by mother earth from the earliest days of civilization. Human race has been doing this with a pride of being the master

of this world and all the resources available are being used without considering the need of millions of other species existing on earth. Every entity on earth has some value irrespective of its use to population and happiness in life is dependent on richness and bio-diversity of the environment. For the sake of development, we have no right to adversely affect this richness and have to use the available resources in a responsible manner. Unfortunately the human impact on bio-diversity has been damaging due to the competition for staying ahead of others, depletion of resources due to exponentially growing population and changing lifestyle. This is possible only if changes in political willpower, economical objectives, suitable technology and human ideology are made peacefully and democratically (Harding, 1997). All the communities, organizations, states and nations should respect the above and every action should keep the above in mind which will ultimately lead to sustainability. If we think of the above concept, we must also think of possible ways to measure actions of firms, communities and nations moving in the direction of deep ecology. The underlying indication of measurement from this concept is about consumption of resources such as power, water, fuel, minerals etc and estimation of wastage and recycling. The other measure would be about internal and external co-operation for development of employees, community and society.

Degrowth

Degrowth is an equitable downscaling of production and consumption that increases human well-being and enhances ecological conditions (Schneider et al, 2010). The concept of degrowth is also aligned with the above deep ecology principles. It puts forward the concept that “a global economic growth is not sustainable and unfeasible from an ecological point of view. It states that the goods and services produced by economic activities of firms are not the only wealth available for creation. Fair justice, healthy ecosystem, reduction of inequality, good human relations

within a society and democratic institutions are other and very important forms of wealth. Nations should formulate policies and firms should work towards creation of this important wealth as well. As resources available for economic activities are limited and finite, overconsumption and wastage will lead to scarcity for future generation. This will degrade the quality of life, biodiversity, natural resources and shall lead to growth in local violence for sharing common resources. The rapid growth and adverse impact thereof was explained through results of a complex computer simulation program World3 jointly by a team of scientists from USA, Europe and Japan which looked at population, industrialization, pollution, food production and resource depletion in different scenario and in their book "Limits to Growth" (Meadows et al, 1972) have cautioned the world about running out of resources if the current trend of overproduction and over consumption is not checked. Updates on this have been published in 2002, 2007 and 2012 where their past predictions are related to current facts. Responsibility of Firms in the direction of degrowth should be to stay small by focusing on right size of profit, right size of production capacities, employment level, market share and customer size. Excess profit is something that would endanger ecological sustainability and social well being of the firms' environment (Jamali et al, 2010). Degrowth has also been referred to as Green Growth (Victor, 2010). The concept of degrowth or green growth is an economic state in which the rate of reduction of environmental impact per unit GDP exceeds the rate of increase of GDP. Brown Growth and Black Growth have also been defined in this line of thought. Even till now developed countries like USA have not shown any better than Brown Growth (Victor, 2010). Degrowth is the intentional redirection of economies away from the perpetual pursuit of growth. This includes a planned and controlled contraction to get back in line with carrying capacity, with eventual creation of a steady state economic system that is in balance with Earth's limits.

The race for development has caused obesity, increasing loan burdens, work stress, health problems, traffic congestion and social isolation. Therefore it is important to reduce overconsumption by individual, community, society, nations and firms. Co-operation, love and sacrifice is the key for reduction of overconsumption and every community or nation should set an example of acting on these themselves while advising others to work accordingly (Assadourian, 2012). It is proposed to do away with GDP & GNP as the measure of economic growth. The GDP Paradox can create a problem in actual measurement of economic well being (Bergh, 2009). Degrowth is the solution for nations and firms to be sustainable (Kallis, 2011). The driving factor for degrowth is co-operation among firms not competition. Co-operation does not mean forming a cartel for exploiting the consumers and affecting the society and environment. This co-operation is essentially to work together by limiting growth benefitting all stakeholders including society and environment. Co-operation can only be achieved as long as a firm or community or region stays within a manageable limit. This will lead to technological evolution and innovation to get more out of the available resources resulting in conservation of natural resources and shall have a positive effect on society and well being of people. Gross National Happiness would be a better indicator of social well being and development of all stakeholders in stead of GNP or GDP (Seeland, 2008) and shall create a friendly atmosphere within people from diverse culture and background (Seeland, 2009). Firms in a bid to grow big and grab more market share resort to unethical practices in advertising which leads to consumption of useless articles. GNH index for every promotional campaign run by firms to regulate the same shall be useful so that overconsumption shall go down (Hellemont, 2009). The meaning, value and feeling of happiness is subjective and is not the same across all cultures and regions which make it difficult for one single yardstick to measure the same and this area needs

further probe on ways to measure happiness and bring the readings to one common level for comparison. Militarism and conflict between countries also has given rise to arms race and over production of defense goods which is disastrous for society (Szell, 2007). Countries also should limit its boundaries to reduce conflicts and small countries which are self dependent shall never engage in conflicts (Galtung, 1970). Self reliance and maintenance of equality within community through a long span of time would lead to more co-operation, harmony and well being of the society (Gamson & Palgi, 1982). We owe this environment to our successors and we must make an effort to decide about the type of world we want to spend our life now and what we keep in store for the future generation (Robinson, 2004). The issue of sustainable consumption and production will need to be considered in a broader context of an ailing social order, one characterized by competition, conflict and insecurity, of which it is a part. Ultimately, the transformation required to shift towards sustainable consumption and production will entail no less than an organic change in the structure of society itself so as to reflect fully the interdependence of the entire social body, as well as the interconnectedness with the natural world that sustains it (Bahá'í International Community. 2010). Every component of nature has the right to exist, interact and evolve and thus contribute to self organization and rhythm. If some component is favored at the expense of others, the integrity of nature, its unity, wholeness and interconnectedness would be destroyed and this would destroy its rhythm (Desai, 2009). Gandhi during freedom movement of India advocated the concept of "sarvodaya" which translates as welfare for all. He conceptualized the dynamics between individual and collective welfare and advised people not to reduce welfare of few individuals in the name of benefit to the majority (Bakshi, 1998). The Prisoners dilemma game was simulated and after millions of iterations it was inferred that wellbeing of all the actors increase only when there is increased co-operation

(Nowak, 2011). Though there had been argument against this (Press & Dyson, 2012) stating that selfishness and zero-determinant strategy wins, it has again been reinstated through research (Hilbe et al, 2013 and Adami & Hintze, 2013) which indicated that co-operation ultimately is the winning strategy for the long run which would lead to sustainability. Culture also plays a vital role in reinforcing human behavior and relationship between individuals, communities, nature and environment. Promoting intercultural dialogues to harness social cohesion will create an environment which will be conducive to development (UNESCO, 2012). All these concepts lead to the dimension of reduction of consumption and increase in co-operation. This also reinforces the latent performance measurement concept within deep ecology. The following table indicates the focus of each literature mentioned above.

TABLE 1: LITERATURE ON SUSTAINABILITY

Reference	Inherent focus
Schneider et al, 2010	Reduction of consumption and production through co-operation
Meadows et al, 1972	Reduction of consumption and production through co-operation
Meadows et al, 2002	Love, sacrifice and co-operation are the driving force for sustainability
Jamali et al, 2010	Reduction of consumption and production through co-operation and staying within limit
Victor, 2010	Reduction of impact on environment through co-operation
Assadourian, 2012	To do away with competition
Nayak, 2011	Love, co-operation and sacrifice creating a deep relationship within entities at micro level shall lead to sustainability of the eco-system at the micro level to strengthen the weakest in the system and this is possible and logical.
Bergh, 2009	Wellbeing of everyone can be the indicator of growth
Kallis, 2011	Degrowth is the only solution for wellbeing of individual, community and nation. This is achievable through co-operation only
Seeland, 2008 and 2009	Co-operation and intercultural interaction
Hellefont, 2009	Reduce overconsumption through co-operation
Szell, 2007	Over production creates instability leading to disaster. Co-operation for decrease in production necessary for sustainability
Galtung, 1970	Self-dependence will reduce conflict. This is possible through co-operation. Co-operation is possible when the size of the community / firm is kept small by design.
Gamson & Palgi, 1982	Self reliance and maintaining equality within community leading to

	co-operation and harmony
Robinson, 2004	Intergenerational wellbeing
Bahá'í International Community. 2010	Co-operation
Desai, 2009	Relationship between every single entity of nature for harmony and rhythmic co-existence
Bakshi, 1998	Gandhian concept of "Sarvodaya" or welfare of every individual
Nowak, 2011	Co-operation is the winning strategy through hope, generosity and forgiveness
UNESCO, 2012	Cultural interaction for better co-operation

With all the above background, it is now imperative that sustainable development for nations and sustainability performance for firms are going to be the religion of the future and this is possible only through love, co-operation and sacrifice which will lead to degrowth. The ancient literature also primarily focused on these aspects advising mankind to be kind, compassionate, empathetic and committed to the welfare of the weakest of the society. It is just a matter of time before the actors of the society realize this need. The most important fact is that, people must realize the gravity of this before it is too late. Therefore co-operation and not the competition hold the key for sustainable development. In the industrial era, organizations contribute the most to national welfare and thus play a vital role for sustainability. Their act of competition through over production and over-exploitation of resources creates damage to environment and society. Firms must cooperate with each other for welfare of society and environment which will lead to sustainability. But how we know if a firm is behaving in sustainable manner? Here comes the need for a sustainability metrics to measure sustainability performance of firms. Before we go further into firm level activities on sustainability, we take a look at the history of Sustainability.

Sustainability

There have been debates and arguments going on for decades to bring out a comprehensive definition of sustainability and sustainability performance of firms. Many companies only

allocate some funds for CSR activities and in India the funds are mostly handed over to local administration for taking up peripheral development in improving road communication, health care, education etc., where donor firms rarely go for monitoring and evaluation of the fund they provide. They think that by contributing for such activities through Government is enough for creation of sustainability and this they use as a marketing tool everywhere. The history of Sustainability dates back to early human civilization where a community or region developing by using surrounding natural resources and then during some crisis arising due to external threat try to resolve the issue to survive and sustain or perish under its pressure. The industrial revolution prompted use of the fossil fuel deposits which are non-renewable and in the race for rapid growth people generally ignored the fact that with rampant use the deposits, the supply might end in decades. This also has adversely affected the environment. Sustainability is about building a society where firms address the triple bottom line instead of profitability as the only measure of performance. Firms moving towards creating a balance between economy, society and environment would be seen as approaching sustainability performance which will make them maintain and expand economically, increasing shareholder value, enhancing corporate image, creating customer delight, improving quality of products and services, following ethical practices, improving the quality of human resources, creating value for all stakeholders and also taking care of people who might lose out their land and resources in the process of establishment and operation of the firm. To achieve this, mere allocation of certain percentage of economic profit as CSR fund shall not be enough until these are not linked to the business strategy of the firm and not being driven by the vision and mission of the firm. Firms also would gain out of sustainability initiatives. These activities shall reduce risks, waste, increase material and energy efficiency, innovate and develop environment friendly products this makes the operation

profitable and makes the firm stand out in the long run. The firms therefore should integrate economic, social and environmental objectives into their business strategy and strike a balance between these three (Szekely and Knirsch, 2005). Sustainability is not just a one shot activity. Sustainability spreads across a larger space with many stakeholders spread over a very long period of time. It refers to a natural open system which is diverse and heterogeneous in character. The objective function is to balance and optimize multiple objectives of the ecosystem and manage with self control while helping to strengthen the weaker stakeholders through an attitude of giving, loving and sacrificing (Nayak, 2011). Love, sacrifice and co-operation are going to help achieve sustainability (Meadows et al, 1992). Global changes in terms of development of industrial establishments there by rivaling nature in many facets, Land conversion from traditional use to industrial use, Population growth, biodiversity loss, agricultural intensification in terms of rampant use of pesticides and insecticides induce climate change and ozone depletion which affects the weakest of the society the most (Daily and Ehrlich, 1996). Research has established that several common pollutants increase at a society having lower levels of per capita income and decrease at high levels (McConnell, 1997). Therefore approaching sustainability performance would create a better environment and improve the lifestyle of even the weakest stakeholder. Sustainable development normally is referred human wellbeing to be the object to be sustained. Some look at the current generation's wellbeing where sustainable development leads to the wellbeing of future generation which is at least as high as the well being of the current generation. Others classify it as intergenerational wellbeing where they define social welfare as not the only well being of the current generation but also include the potential wellbeing of the generations to follow (Pezzey, 1992). While estimating these, only economic capital is not to be considered. It is important to consider natural capital, human capital,

reproducible capital and environmental capital to work out a broad spectrum to determine the movement for sustainable development (Arrow et al, 2004). The movement for sustainability started in 1962 by Researcher Rachel Carson who brought together research on toxicology, ecology and epidemiology in the book “Silent Spring” to suggest that agricultural pesticides are building to catastrophic levels, linked to damage to animal species and human health (www.iisd.org). This was followed by various conferences on Biosphere, Paul Ehrlich’s publication “The Population Bomb”, formulation of National Environmental Policy Act by USA, continuing deliberations and debates by WTO, UNEP, Global Reporting Initiatives and Climate Negotiations. Sustainability is about continuance where we need to look into two different strategic aspects of survival of any entity. The law of natural selection explained by Darwin’s evolutionary theory puts forward competition as the driver of evolution. However competition does not explain all the evolutionary phenomena and for that cooperation between entities are the driving force for evolution and development (Nowak, 2011). Without co-operation within individuals, communities, societies, organizations and nations, we can never approach sustainability. This of course is not a recent statement, rather rediscovered after the whole world woke up to the hard reality of man-made ecological catastrophe in terms of green house effect, pollution and deforestation. If we just look at above timeline, we might think that sustainability development is a recent concept. While discussing and arguing on this issue, we must also realize that the same belief was being propagated through ancient and religious literature which was rarely followed leading to the forecasted critical scenario. Let us browse through some ancient and religious literature which brings out the essence of sustainable development. The following is arranged in chronological order of origin as per timeline information mentioned in www.wikipedia.org.

TABLE 2: ANCIENT LITERATURE AND SUSTAINABILITY

Source	Year of origin	Reference	Description	Latent advise for welfare
The Rigveda 06.48.17	1500 – 1100 BCE	Griffith, 1973	The importance trees / forests for reduction of pollution explained and advised not to destroy forests	To consume as much as required, not to over consume and destroy. Live in harmony with nature and co-operate, not compete with each other to grab more resource
The Rigveda 5.43	1500 – 1100 BCE	Griffith, 1973	Rigveda advises to let forests grow and not to pollute air and space and not to harm the environment	To co-operate with others, love the environment and go for sacrifice of own need to protect nature
Atharvaveda 19.2.1-2	1500 – 500 BCE	Griffith, 1895	Importance preserving the purity of water is explained here and advised not to pollute and waste the water bodies	Not to pollute entities on which we are always dependent
Atharvaveda 3.24.5	1500 – 500 BCE	Muniapan & Dass, 2008	We must help each other and protect each other without being envious. Wealth is just a tool which should serve welfare of the society and common good of the society	Society with deep loving relationship within each other
Mundaka Upanishad 1.1.1	1200 – 500 BCE	Desai, 2009	It is in the interest of the mankind to plant more and more trees as these safeguard the water resources	Avoid cutting trees, plant more trees in the larger interest
Book of Leviticus 25:23	500 – 300 BCE	Rabbi Rosen	The land should lie fallow after every six years to recuperate its natural vitality	No over-exploitation of natural resource
Bhagwad Gita 9.8	500 BCE – 200 CE	Sri, 2000	Soul is immortal and rebirth takes place after death in different forms. So we will again come back in future in some form. We must preserve nature and should not harm any resources so that we get similar environment in future	Preserve natural resource
Mahabharata, Shanti Parva,	400 BCE – 400 CE	Ganguli, 1896	The tree which gives us food and shelter should	Co-operation with environment

Sec 89, P194			never be cut down	
Dhammapada, Buddhism Holy scriptures, Ch.1 verse 10	300 – 200 BCE	Bhattacharjee, 2012	One must be virtuous and be on the right path which will be beneficial to the society	Love and co-operation
Dhammapada, Buddhism Holy scriptures	300 – 200 BCE	Romanos and Auffrey, 2002	One must overcome greed, lust, hatred and ignorance	To be in harmony with others and the ecology
Arthashastra by Kautilya	400 BCE – 200 CE	Muniapan & Dass, 2008	A king or head of state should have no self-interest, happiness and joy for himself and his happiness lies within the welfare of the people	No one is master and all interdependent therefore welfare of every individual need to be sought for collective well being
Arthashastra by Kautilya	400 BCE – 200 CE	Sharma, 1994	The leader must have concern for the people and should act so that the weakest and poorest gets benefited.	As every entity is interconnected, harm to even the weakest would have adverse effect on even the strongest.
The Holy Bible Luke 6:32-36	200 to 100 BCE	Bhattacharjee, 2012	If you love those who love you, what benefit is that to you? For even sinners love those who love them. And if you do good to those who do good to you, what benefit is that to you? For even sinners do the same. And if you lend to those from whom you expect to receive, what credit is that to you? Even sinners lend to sinners, to get back the same amount. But love your enemies, and do good, and lend, expecting nothing in return, and your reward will be great, and you will be sons of the Most High, for he is kind to the ungrateful and the evil. Be merciful, even as your Father is merciful	People can not be classified as pious or sinner and good deeds can not be done for good people only. Unless every individual is developed within a society of trust and co-operation, overall development of society can not take place.
The Holy Bible	200 to 100 BCE	Nelson, 1995	God is displeased with the population explosion and	Reduction of overexploitation of

			human being are not able to fulfill his intent, destroying the resources	resources
Charaka Samhita	200 BCE	Dwivedi, 1993	Air and water pollution is the cause of many diseases.	We should refrain from pollution and co-operate with nature
Holy Qur'an	609 – 632 CE	Umar and Khamidi, 2012	Do good as Allah has been good to you and do not seek to cause corruption in the earth. Allah does not love corrupters	Responsible consumption and co-operation
Guru Granth Sahib SGG:723	1604 CE	Singh D	Air, water earth and sky are God's home and temple - sacred places which need to be protected and looked after	Co-operate with nature to avoid exploitation

It can be observed from above that all our ancient literature focus on the issue of love, co-operation and sacrifice for wellbeing of the future generation and preservation of resources which is currently being emphasized by scholars like Martin Nowak. As people are greatly influenced by religious verses, these statements were possibly embedded into the religious literature with a vision to increase co-operation, love and sacrifice for others' wellbeing for creating a better world. People all over the world are now working on reduction of overconsumption and new concepts of deep ecology and de-growth is emerging. There have been many proposals to find out possible factors for measurement of sustainability performance. Before we proceed further, the question comes to mind that how to say this firm is making progress towards sustainability. What can be the measures of sustainability performance?

Indicators of Sustainability Performance

Many scholars, activists and organizations have been working to converge into a common list of factors which can be used to indicate sustainability performance of firms. World Resources Institute proposed measurement of environmental performance in the context of sustainability performance on four aggregate indicators namely pollution, resource depletion, ecosystem risk

and environmental impact on human welfare (Hammond, 1995). For sustainability performance of firms, it is important to develop sustainability of nature (earth, biodiversity, ecosystems) through development of people (child survival, life expectancy, education, equity), sustainability of life support (ecosystem services, resources, environment) through development of economy (wealth, productive sectors, consumption), and sustainability of community (cultures, groups, places) through development of society (institutions, social capital, states, regions) (Parris and Kates, 2003). Wellbeing Index (developed by The World Conservation Union) and Environmental Sustainability Index (developed by The World Economic Forum) are also used for measurement of sustainability for countries and regions. The Sustainability Assessment Model for firms developed by BP uses 22 performance indicators under four broad categories of environmental impact, economic impact, resource impact and social impact (Baxter et al, 2004). Sustainability performance of firms can also be measured through indicators beyond triple bottom line by measuring ethics, values and principles, accountability and transparency, commitment to triple bottom line, focus on environmental processes, socio-economic development, human rights and workplace conditions and engaging business partners (Hubbard, 2006). Cost based approach by estimating monetary impact of business operations and offsetting the same from revenue generation can be one approach of measurement (Nourry, 2007) of sustainable development. Full cost accounting approach proposed through measurement of Green Value Added by a firm by subtracting cost of estimated environmental damage from the Economic Value Added to measure corporate sustainability performance (Atkinson et al, 1999). Another approach for measurement of firm sustainability performance is through sustainability linkage and factors of socio-environmental, socio-economic and environmental-economic (eco-efficiency) issues (Ranganathan, 1998). Sustainability within a firm is influenced by both

internal and external factors. We take the approach suggested by Szekely and Knirsch in 2005 as given below as we find this to be inclusive of all above approach where both internal and external factors and their sub-components are well discussed. The factors that determine sustainability within a company (Szekely and Knirsch, 2005) are Internal: managerial factors, operational factors, and economic factors and external: market factors, government factors and stakeholders' expectations. The following table summarizes the literature on indicators of sustainability performance and tries to capture the latent thoughts while proposing the same.

TABLE 3: SUSTAINABILITY INDICATORS IN LITERATURE

Reference	Indicator focus	Underlying concept	Remark
Hammond, 1995	Human welfare	Consume and produce responsibly though co-operation	Indicators may capture just the numbers for the year but can not provide analysis over a larger space and time
Parris and Kates, 2003	Human welfare and protection of nature	Co-operation	
Baxter et al, 2004	BP Model on environmental and social impact	Co-operation to reduce resource depletion and increase welfare of all stakeholders	
Hubbard, 2006	Ethics and Values	Co-operation, love, sacrifice and commitment	
Nourry, 2007	Cost Based	Negative impact of firm action to be accounted for to check how it fares on welfare front	
Atkinson et al, 1999	Green Value	Negative impact of firm action to be accounted for to check how it fares on welfare front	
Ranganathan, 1998	Sustainability Linkage	Welfare	
Szekely and Knirsch, 2005	Internal and external factors	The performance of firm all triple bottom line with respect to both external and internal factors	

Many firms while reporting sustainability performance more or less follow the above points to determine the performance indicators. We are presenting in Table 4 a list of sustainability metrics on three bottom lines drawn from reporting formats used by about 20 large firms like Allianz, Siemens etc. (Szekely and Knirsch, 2005).

Table 4: SUSTAINABILITY METRICS

Economic Sustainability Metrics	Environmental Sustainability Metrics	Social Sustainability Metrics
<ul style="list-style-type: none"> • Total Income • Earning before tax • Net Income • Earnings per share • Total expenditure on purchase of goods, services and materials • Equivalent monetary value of all benefit to staff • Interest on liabilities and dividends • Change in retained income • Taxes paid to authorities • State subsidies and assistance • Donations to communities, civil societies and others in cash and in kind • Investment in R&D • Capital Expenditure • Cash Flow • Expenditure on Employee Health and Safety • Total spending for culture and society • Total cost of personnel • Return on capital after tax • Appropriation of funds to shareholders (dividends), to employees (wages, benefits), to the state (taxes, levies, duties etc), to creditors (interest) and to the company (reserves) 	<ul style="list-style-type: none"> • % of employees in Environment Management • Energy consumption • Water consumption • Emission of greenhouse gases • Waste per employee per year • Paper consumption • Business travel • Total material consumption • Waste recycling • Acceptance of return of used products • Fines, sanctions and penalties for non-compliance • Emission to water • Volume of waste water • Total spending on environmental protection • CO2 emission • Number of services identified with potential to contribute to sustainability • Dust Emission 	<ul style="list-style-type: none"> • Total number of employees • Staff in Training • Average participation of employees in education measures • % proportion of female employees in management and executive positions • Average fluctuation and net change in employment • Practice of documentation of industrial accidents and illness • Lost days/absence due to injuries in industrial accidents and work-related deaths • Average hour of training / further training per employee • Number of trainees • Cost of personnel • Disabled employees • Idea management and employee participation programs • Percentage of largest 25 suppliers that fulfill social criteria • % of part time employees • Number of employee projects • Expenditure on training • Average year of service of employees in company

The above is compiled from reporting formats presented by Szekely and Knirsch, 2005

The list can be indicative but may not be exhaustive. In the current societal scenario of India and other developing countries, we propose to add the following in the above list which might be

useful indices. Social Sustainability Matrix: tolerance to all religion, tolerance towards gays and lesbians, tolerance to all castes, alignment to ideology of different political factions, employment to ex-military personnel, employment to former extremist persons or having past crime records who have joined mainstream after change of heart, level of involvement of firms in corrupt and unethical practices for getting benefit to shareholders, employment from adjoining province, provinces having no common border and highly underdeveloped provinces, use of child labor, forced or involuntary labor, reported cases of harassment to employees of different gender, number of incidents of delay in payment of wages, number of grievance submitted by employees. Environmental Sustainability Matrix: level of adoption of new energy efficient and non-polluting technology, procurement of natural raw material in responsible manner, efforts made for reconstruction of bio-diversity

Assessment of Sustainability Performance

Now we face challenge of measuring the sustainability performance of firms in a longer span of time where the quantification is absolute and also the performance of a firm with respect to others where it is relative. Mere reporting figures will not be sufficient to capture these aspects which will not be very useful to scholars engaged in empirical research. Once the time line is captured, the next challenge comes about judging the value base within the indicators.

Interpretation of table 1 and 2 of this paper leads to the assumption that value based approach for sustainability will encompass the stakeholders' welfare and ensure intergenerational wellbeing.

This is primarily because of the intent to strengthen the weakest in the society, promote respect for every entity in the ecosystem, tolerance to heterogeneity and equality through co-operation, love and sacrifice (Nayak, 2011). We have therefore modified the metrics in Table 5.

Table 5: PROPOSED SUSTAINABILITY METRICS

Economic Sustainability Metrics	Environmental Sustainability Metrics	Social Sustainability Metrics
<ul style="list-style-type: none"> • Average economic Impact on lower division members of firm as % of total income of firm • % of expenditure on purchase of goods, services and materials on Total income • % of expenses made for procurement of goods and services from local sources • Liabilities on total income • Taxes paid to authorities on total income • State subsidies and assistance received on total income • % of income for Donations to communities, civil societies and others in cash and in kind • % of income as Investment in R&D • % of income as investment on Capital Expenditure involving modern eco-friendly technology • % of income as total spending for culture and society 	<ul style="list-style-type: none"> • Consumption of (a) Energy (b) Water (c) Paper per unit currency of income • Waste in unit per employee per year • % Waste recycling • % Acceptance of return of used products • Fines, sanctions and penalties for non-compliance as % of total income • Emission of greenhouse gases to air and pollutant to water in ppm per unit currency of income • Level of air and noise pollution • Volume of waste water as % to total water consumed • % of income as total spending on environmental protection, tree plantation, soil conservation and rainwater harvesting 	<ul style="list-style-type: none"> • Total number of direct, indirect and outsourced employees • % of employees encouraged /assisted for higher education and skill development • % proportion of female employees in management and executive positions • % of employees who have same sex orientation, physically challenged, of lower caste, of minority religion, staff who are ex-military persons, who are ex-militants or ex-convicts who joined mainstream of life, from other provinces and underdeveloped provinces • % Documented industrial accidents including near miss and illness upon total employee • Average hour of training per employee • % of employee participation ideas implemented • Number of welfare projects • % Expenditure on Employee Health and Safety • % of income spent on training • Reported cases of child labor, forced or involuntary labor, employee harassment as % of total staff • Total number of grievance reported and redressal accorded upon total staff

It may be observed that many of the indicators have been removed from Table 4 in the above tables as we find them not to be able to capture the value based approach and many indicators have been made in percentage terms to judge the firm on a timeline and with respect to other firms in the same industry.

The economic metrics above might be able to judge firm of any form such as corporate, proprietary, trust, community based, co-operatives of any size with motive for either profit or non-profit. They might also indicate the productivity of transformation process, dependence on local community, leverage of the firm and its outstanding due for payment, transparency on transactions, level of self reliance, intent of the firm for social welfare, for better goods and services, to upgrade to more efficient technology with less wastage, social welfare. The environmental metrics might better capture resource utilization of the firm, wastage in transformation process, intent of the firm for renewal of resources, attitude of firm towards customers, intent of firm to violate law of the land, environmental impact of firm's operation, wastage of resources and firm's intent for environment protection. The social metrics also can reflect size of the firm, intent of firm to improve skill of the employees, equal treatment for both genders, intent of the firm to engage in welfare of the section where least attention is paid, health and safety concern of the firm, intent of firm to improve skill of the employees, involvement of employees in the firm's development, intent of the firm for welfare of the employees, commitment of firm for welfare of society and employees.

Discussion

With limited resource available to mankind for creation of products and service, overexploitation and overconsumption leads to scarcity for the future generation and

emphasizing shareholders' value over societal and environmental development. The concept of deep ecology and degrowth is gathering momentum all over the globe where human happiness is treated as a better indicator of growth instead of GDP. These are not new concepts and have been emphatically present in all our ancient literature.

The sustainability focuses on triple bottom line and so far the firms announcing to work towards sustainability and declaring their efforts in this regard are primarily large ones. When we look into the ancient literature and the current propositions in literatures, we understand that value based approach towards sustainability with love, affection community feeling, selfless actions, sacrifice are going to hold the key for welfare. If we try to assess through the lenses of value base, it will automatically bring in the welfare of stakeholders and the intergenerational welfare.

This paper listed down various parameters, both internal and external, which are used by large firms to measure the level of their sustainability performance. As these indicators do not reflect the dynamics of sustainability action and comparative analysis within industries, this paper proposes an alternate metrics which might be useful for cross-sectional and longitudinal analysis of firms while reflecting the value based approach adopted by the firm towards sustainability. This might be useful for researchers to look at sustainability action of firms. This also might be useful for policy makers to provide institutional interventions to promote sustainability performance within firms.

These indicators shall; be useful across all size and type of firms as the sustainability performance will limit the unwarranted growth of firm leading to lower consumption and production and exploitation of resources. We are also in the process of making an empirical study on sustainability performance firms in India where we intend to blend the role of strategy for sustainability performance and possible limitation of firm size evolving from the strategy adopted.

Conclusion

This paper has made an attempt to compile the concept of sustainability performance in light of various stages of theoretical developments and practical implications thereof. Within the sphere of development and growth, there has always been an undercurrent which points towards the exhaustion of resources and diminishing bio-diversity. Debates, deliberations and discussions are endless where we talk about preservation of environment, development of society, increase in social well being and happiness. All these need translation into action and effort at individual level is not all that sufficient to avoid probable collapse of ecosystem in the future. We need collective efforts from individuals, communities, societies, firms and nations together to make this possible where love and sacrifice holds the key leading to value based sustainability performance. However, no conclusive measurement metrics has been developed in this regard which can indicate clear and definitive sustainability performance of firms. This area needs more clarity and requires convergence of thought within academics, practitioners and policy makers.

The paper has listed the sustainability metrics as per reporting formats of large firms. However the challenge before researchers to measure the sustainability performance about the

internal performance improvement and performance with respect to others are not addressed so far. We have reconstructed the metrics and have further enhanced the same to capture the value based approach of firms towards sustainability and have brought in some indicators in this regards. This area needs further insight to develop a workable, practical and effective metrics which will enable researchers and policy makers to co-ordinate and catalyze sustainable development.

With the role of deep inter-relationship of entities within the ecosystem for sustainability, it is vital to frame the indicators for guidance from researchers, command and control from policy makers to ensure the firms moving in the right path collectively. This will help firms gain through better efficiency in the form of reduction of cost and wastage and boosting of employee morale apart from building a just, fair and co-operative community. During this path of change, there will be some trade-off for shareholders which might cause initial discomfort but will bring back the benefits in the long run.

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