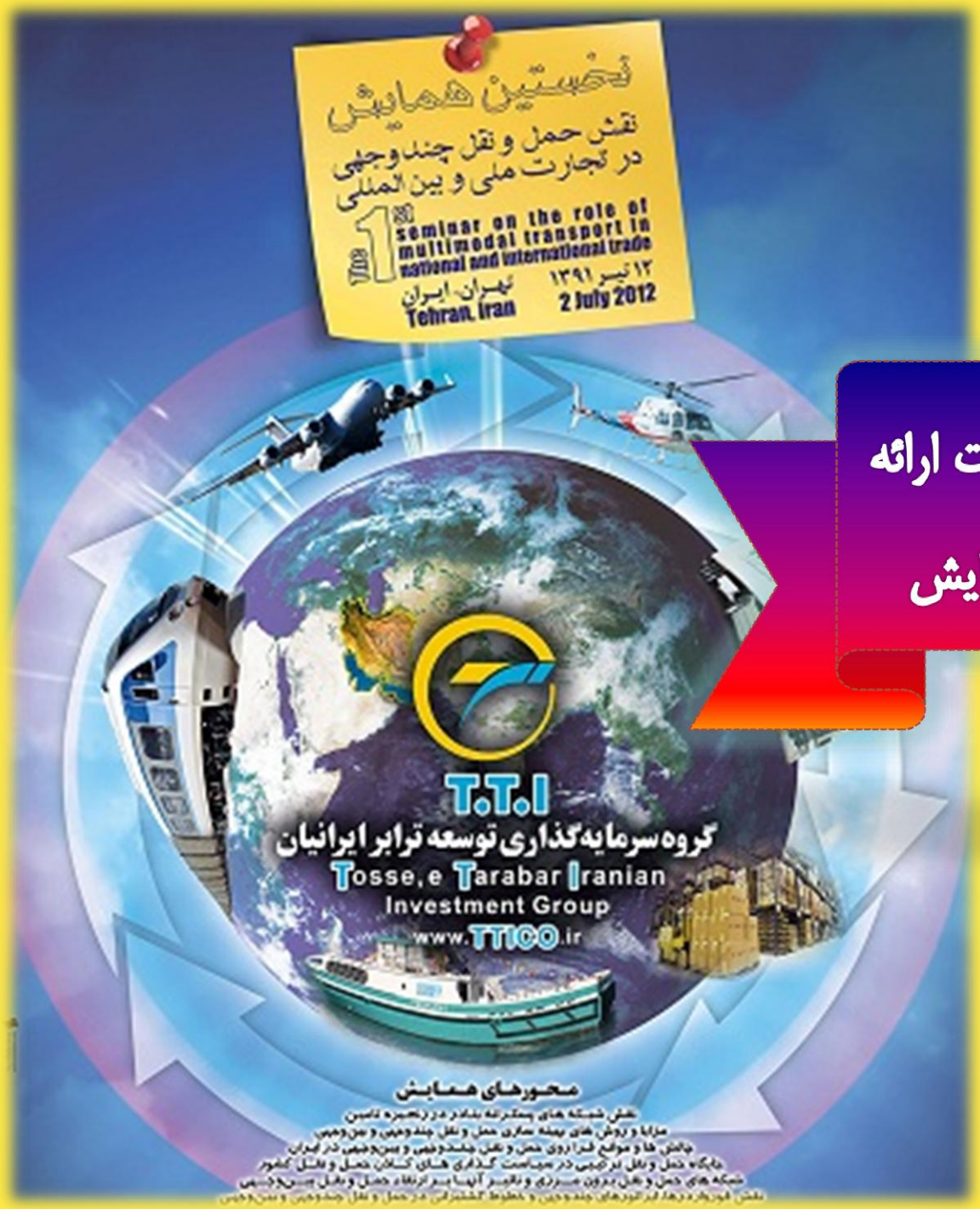

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REVERSE LOGISTICS AND SOCIAL SUSTAINABILITY

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Overview

- What is it?
- Why Do it? -Practice
- Research – Theory
  - Framework
  - Theories
  - Modeling
- Future Directions?

INTRODUCTION

- The strategic application of reverse supply chain logistics or reverse logistics (RL) is to improve the reclamation of products at the end of their useful life.
- The environmental implications of reclamation, reuse, and recycling to save landfill space, energy, and costs are important for organizations.
- There are also benefits to using returned products in the production process and a growing interest in consumer recycling

REVERSE LOGISTICS AND SOCIAL SUSTAINABILITY

Several industries have relatively well established RL processes and channels for used and end-of-life materials including:

- Automotive parts
- Beverage containers
- Plastic parts
- Cameras
- Electronics
- printer/copier toner
- Batteries
- Chemicals
- paper industries

REVERSE LOGISTICS AND SOCIAL ISSUES

RL has been defined as:

- The process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods, and related information from the point of consumption to the point of origin for the purpose of recapturing value.
- The reverse distribution of materials and recycling, as well as reducing the quantity of materials in the forward system.
- An organizational strategy that can help decelerate or prevent environmental degradation.

Table 1. Category I: Social Responsibility

Authors	Summary Conclusion	Frameworks offered to assess Sustainability
Category I		Social Responsibility
Friedman (1962)	There is one and only one business – to use its resources and engage in activities to increase its profi ts so long as it stays within the rules of the game, which is to say, engages in open and free competition, without deception or fraud".	social responsibility of Constrained profit-making view
McGuire (1963)	The economic and legal duties of the companies should be extended by certain responsibilities to society.	Corporate citizenship
Carroll (1979)	Social Responsibility exists broadly in four components such as economic, legal, ethical and discretionary expectations that society has of a company and that companies have to decide which layer they focus on.	Three-dimensional Conceptual Model
Barry (2000)	Social responsibility can be a feasible overall strategy, particularly in less competitive markets.	Constrained profit-making view
McWilliams and Siegel (2001)	Corporate social responsibility is both voluntary and discretionary by organizations. Stakeholders can assert moral attributions of the organization's intentions to their social responsibility actions.	Strategic Investment
Margolis and Walsh (2001)	Corporate social responsibility protects and insures corporate nancial performance.	Stakeholder theory
Dawkins and Lewis (2003) and Baumgartner and Ebner (2005), Jenkins (2004, Igalens and Gond (2005)	Describe Corporate Responsibility as a synonym for CSR. Responsibility includes employee treatment, community commitment, ethics and environment.	Ethical concept of triple-bottom-line
Graafl and et al., (2004), Godfrey (2005) , Pirsch et al., (2007)	Corporate social responsibility protects and insures corporate financial performance.	Stakeholder theory

Corporate Social Responsibility (CSR)

- CSR are actions not required by law but furthering social good and extending beyond the explicit, transactional interests of an organization (McWilliams & Siegel, 2001).
- CSR is frequently used to frame company attitudes, strategies and relationships with stakeholders (Jenkins, 2004).
- Addressing ethical values, economic well-being, and compliance with legal requirements (Lehtonen, 2004).
- CSR protects and insures corporate financial performance (Godfrey 2005; Pirsch, Gupta, & Grau, 2007).

WHAT IS SOCIAL SUSTAINABILITY?

We define sustainability into at least three major dimensions:

- Economic
- Environmental
- Social

Environmental sustainability

Environmental sustainability emphasizes management of natural resources while social sustainability emphasizes management of social resources including people's skills and abilities, institutions, relationships and social values.

(Ahmed & McQuaid, 2005).

Social Sustainability

Social sustainable development has included:

- Raising education standards, nation's health (Pearce et al., 1996).
- Maintaining cultural diversity (Munasinghe & Shearer, 1995).
- Support of social justice issues (Pearce, 1988; Norgaard, 1988).
- On a corporate level, social sustainability means organizations add value to their communities by increasing the human capital of individuals and furthering the societal capital of communities (Dyllick & Hockerts, 2002).
- Corporate sustainability provides a basis for CSR (Igalens and Gond 2005)

Table 2. Category II: Social Sustainability

Authors	Summary Conclusion	Frameworks offered to assess Sustainability
Category II		Social Sustainability
Frederick (1994)	Examines the corporate social responsibility concept from a stakeholder perspective	
Meadows et al., (1992)	A sustainable society is one that does not undermine itself, physically or socially, and persists over generations.	
Munasinghe and Shearer (1995)	Sustainable society must exist within a framework of cultural diversity.	
Pearce et al., (1996)	Social sustainable development represents the formation of social systems that enable education standards to rise and a nation's health and the overall standard of living to improve.	
Hossain (1995) Marcuse (1998) Pearce (1988)	Sustainable society must be based on social justice since disparities of privilege and wealth lead to disharmony	
Dyllick and Hockerts (2002)	On a corporate level social sustainability means organizations add value to their communities by increasing the human capital of individuals and furthering the societal capital of communities	The Triple Bottom Line (TBL)
Dawkins and Lewis (2003) Quazi and O'Brien (2000) Douglas et al., (2004) Baumgartner and Ebner, (2005) Igalens and Gond (2005)	Social sustainability is related to corporate social responsibility and many times these terms have been used interchangeably. Ecological aspects or the economic dimension of SD are omitted from the CSR framework	The Triple Bottom Line (TBL)
Ahmed and McQuaid (2005)	Social sustainability emphasizes management of social resources including people's skills and abilities, institutions, relationships and social values	

The Triple Bottom Line Focus and Social Sustainability

Another aspect of sustainability, which we focus on in this paper, is the "triple bottom line“:

- The expanded accounting measure of financial performance that includes environmental and social performance (Elkington, 1998).

- By adopting the triple bottom line philosophy an organization takes a position on economic prosperity, environmental quality, and social justice (Brundtland, 1987; Hardtke & Prehn, 2001; Presley, Meade & Sarkis, 2007).

Table 3. Category III: The Triple Bottom Line Focus and Social Sustainability

Authors	Summary Conclusion	Frameworks offered to assess Sustainability
Category III		The Triple Bottom Line Focus and Social Sustainability
Brundtland (1987)	States that by adopting the TBL philosophy an organization takes a position on the three core areas: economic prosperity, environmental quality, and social justice.	The Triple Bottom Line (TBL)
Elkington (1998)	Another aspect of sustainability is the "triple bottom line" or the expansion of the accounting	The Triple Bottom Line (TBL)
Hardtke and Prehn, (2001) Presley et al., (2007)	The triple bottom line assumes social environmental performance can be measured in fairly objective ways and that firms should use these results in order to improve their social and environmental performance	The Triple Bottom Line (TBL)
Labuschagne and Brent (2006)	Focus on sustainability criteria and design a comprehensive framework which is used to assess the social sustainability performance of projects, technologies or the company itself.	The Triple Bottom Line (TBL)
Labuschagne et al., (2005)	Social sustainability issues into four main areas Internal Human Resources; External Populations, Stakeholder Participation, and Macro Social Performance issues	The Triple Bottom Line (TBL)
Presley et al., (2007)	Applied triple bottom line indicators to reverse logistics, their model proposed only generic level factors	The Triple Bottom Line (TBL)
Labuschagne et al., (2004).	The proposed framework of appropriate criteria to assess the sustainability performances of operational initiatives in industry	The Triple Bottom Line (TBL)

Indicators of Social Sustainability

One framework categorizes social sustainability issues into four main areas:

- Internal Human Resources
- External Populations
- Stakeholder Participation
- Macro Social Performance issues

(Labuschagne, et al., 2005)

Internal Human Resources

- Internal human resources category includes practices related to employment stability, employment practices, health, safety, and capacity development.

- Given that most RL organizations are smaller, human resources (HR) issues are often less developed or formalized. Lack of resources limits the amount of human resources support (e.g. health insurance [in the US] or, safety measures) needed in a large, more socially aware and sustainable organization (Popkin & Company, 2005).

- Because the technological developments within RL operations are not as advanced as forward logistics and manufacturing operations, there are typically numerous manual operations, especially for RL activities such as sorting and dismantling (Gonzalez & Adenszo-Diaz, 2006; Herrmann et al., 2006). These manual tasks lead to HR challenges, e.g. management of hazardous wastes, repetitive motions disorders, and other physical ailments.

Internal human resources	Employment Stability	Job Opportunities Employment Compensation
	Employment Practices	Disciplinary and Security Practices Employee Contracts Equity Labor Sources Diversity Discrimination Flexible Working Arrangements
	Health and Safety	Health and Safety Incidents Health and Safety Practices
	Capacity Development	Research and Development Career Development

Employment Stability

The category of employment stability includes both job opportunities and compensation.

- RL activities and functions are influenced by high uncertainties in timing and flows of products and materials through the system (Tibben-Lembke & Rogers, 2002; Rubio, et al., 2008).
- Uncertainty in capacity requirements frequently results in higher levels of employment volatility (Davis-Blake & Uzzi, 1993; Nollen & Axel, 1996; Houseman, 2001).
- Lack of utilizing RL channels (e.g. for recycling) could undermine supply chain effectiveness in RL practices (Breen, 2006).
- Given high uncertainties and variability end-of-life or recycled material supplies, many RL facilities hire temporary workers.

Employment Practices

- Employment practices include disciplinary and security practices, the employee contract, equity in employment, and the development and use of labor sources.

- There are beneficial RL social sustainability practices within this dimension since, one of which is the provision of opportunities for the development of low-skilled workers.

Health and Safety

Hazardous Aspects of Reverse Logistics

- RL's influence on social dimensions may be company or industry specific.
- Safety issues for employees are dependent on the type of product or material flows.
- Substances like chemicals are more hazardous for manual dismantling than materials of more benign returns, such as from the furniture industry.

Hazardous Aspects of Reverse Logistics

Example:

- Shredding processes that cause air emissions or spillage of hazardous chemicals may be more unsafe for workers than sortation processes and disassembly operations.
- I-phones made by Apple computer showed that even a seemingly innocuous product contained hazardous chemicals.
- A global Greenpeace investigation of automobile lead-acid battery collection programs has revealed a massive flow of these extremely toxic wastes from heavily industrialized countries.
- Another health and safety issue is localized pollution from spillages and accidental leakages in the reverse logistics and reclamation process.

Beneficial Aspects of Reverse Logistics

- RL can benefit health and safety when it is combined with process modifications and material substitutions that generate environmental improvements.
- The development of a returns process in reverse logistics can be supported through the use of reusable containers.
- Through discoveries learned from reverse logistics, many industries are studying the ease of disassembly and re-use for products as they plan new designs.

Beneficial Aspects of Reverse Logistics

Examples of industries considering and using processes that generate less waste or are easier to disassemble include:

- Waste-paper production
- Printed-circuit board (PCB) manufacturing
- Corrosion protection to components
- Choosing inks for textile printing
- Potato-starch manufacturing for disposable plates
- Preparation of reusable moulding sands in the foundry industry
- Production of semi-synthetic antibiotics from penicillin.

Capacity Development

- RL provides opportunities to develop new skills, product and process technology capacities.

- Capacity building for RL often needs to be quick and flexible.
- One concrete example revolves around rapid capacity building from RL operations for product recalls.

- RL initiatives may help firms develop appropriate organizational structures for environmental innovations, which consume fewer resources, produce less waste, and create less environmental and social harm (Clayton and Radcliffe, 1996; Clayton et al., 1999).

- Recycling and reuse initiatives will help to reclaim recyclable materials, therefore generating additional revenue streams while simultaneously reducing the level and cost of waste disposal.

Capacity Development: Barriers

Capacity development by RL providers may face substantial barriers such as:

- Even though opportunities exist, lack of size and organizational resources for innovation may be difficult to overcome (Angel del Brio & Junquera, 2003).

- Limited financial resources, the organizational structure, managers' lack of environmental training, short term orientation, the status of the environmental/social issues in the company, smaller enterprises' lower abilities to obtain innovations, and their lack of relationships with external stakeholders (e.g. Sharma, 2000; Bansal & Roth, 2000).

External Population

External population issues related to sustainability include:

- human capital
- Productive capital
- community capital.

(Labuschagne et al., 2005)

External population	Human Capital	Health Education
	Productive Capital	Housing Service Infrastructure Mobility Infrastructure Regulatory and Public Services Supporting Educational Institutions
	Community Capital	Sensory Stimuli Security Cultural Properties Economic Welfare and Growth Social Cohesion Social Pathologies Grants and Donations Supporting Community Projects

Human Capital

- RL development can reduce the demand for primary materials extraction and portend less pollution in developing areas.
- Because most recycling is manual and labor intensive, low-skilled, less developed areas of the world may benefit from job creation.
- With more recycling, pollution effects are lessened and these environmental improvement offshoots can improve public health and human security in general.
- Development of additional RL knowledge can greatly enhance the health and well-being of external populations.

Productive Capital

- Productive capital can include housing, the service and mobility infrastructure, and regulatory and public safety.

- Collection centers must provide appropriate storage until sufficient volumes for recycling are reached.

- Other appropriate storage locations for consumer recyclables may be at a community center, outside a municipal landfill, or in front of consumer's homes or businesses.

- Densification machinery, a productive capital example, is particularly important in city reclamation centers with limited storage space and even at a manufacturer's or retailer's location. With compaction, transportation costs are reduced thus adding to the viability for profitable recycling.

Community Capital

Community capital includes sensory stimuli, security, the cultural properties of an area, economic welfare, social pathologies, and social cohesion.

Social issues effected by RL recycling include:

- economic security (assured basic income)
- food security (physical and economic access to food)
- health security (relative freedom from disease and infection)
- environmental security (access to sanitary water supply
- clean air and a non-degraded land system)
- personal security (security from physical violence and threats)
- community security (security of cultural integrity),
- and political security (protection of basic human rights and freedoms).

Stakeholder Participation

Stakeholder participation includes both:

- Information provision and
- Stakeholder influence issues.

(Labuschagne et al., 2005)

Stakeholder participation	Information Provision	Collective Audience Selected Audience Stakeholder Engagement
	Stakeholder Influence	Decision Influence Potential Stakeholder Empowerment

Stakeholder Participation

Information Provision

- Information provision is essentially improving communication to the affected constituencies.
- A number of companies include information on their recycling and ‘green’ programs in their annual reports and specific sustainability reports.

- RL dependent companies incorporated have detailed their RL processes clearly in their sustainability reports.
- RL Companies emphasizes their stakeholder relationships for its programs including critical RL operations.

Stakeholder Influence

- Emphasizing a life-cycle approach for products and materials is important and should include learning and knowledge sharing programs for customers, suppliers, vendors, and all members of the supply chain.

- Organizations effectively argue their legitimacy by pointing to stakeholder requirements for RL activities.
- Stakeholder communications should incorporate potential advantages of RL from both financial and social perspectives.

- Shareholders want value from RL activities, while other stakeholders focus more on social and environmental factors.
- Other issues to consider in RL are the desires of the end consumers.

Macro Social Performance

The final category of macro social performance includes:

- Socio-economic performance measure.
- Socio-environmental performance measure

Labuschagne et al. (2005)

Macro Social Issues	Socio-Economic Performance	Economic Welfare Trading Opportunities
	Socio-Environmental Performance	Monitoring Legislation Enforcement

Socio-Economic Performance

- Socio-economic performance includes economic welfare and trading opportunities.
- These development and trading opportunities begin at the design stages of many product supply chain environments with unique designs that support the development of markets for such products.
- These types of designs help create critical volumes of products for recycling, allowing organizations to accept the products of competitors in their RL channels.
- Additional socio-economic dimensions include consideration of the multiple stages of RL. The recycling of old materials requires collection, sorting, and processing and portability is influenced by the efficiency achieved through coordination and integration.

Socio-Economic Performance

- Strategic factors to consider in RL include costs, overall quality, customer service, environmental concerns and legislative concerns.

- The economic value of the conserved energy at the raw material preparation or harvest and the avoided disposal costs should be greater than the cost associated with collection and recycling for RL to be viable.

- On the operational side, factors to consider are cost-benefit analysis, transportation, warehousing, supply management, remanufacturing and recycling, and packaging.

- The insights about these factors form the state-of-the-art knowledge on the keys to the successful design and use of RL systems. (Dowlatshahi, 2000).

Socio-Environmental Performance

- Socio-environmental performance includes monitoring, legislation and enforcement of measures to ensure environmental compliance (Byrne and Deeb; 1993; Carter and Ellram, 1998) and value reclamation through the returns process (Andel, 1997; Stock, 1998).

- The motivation for environmental innovation and creativity comes from regulatory pressure. (Porter, 1991; Porter and van derLinde, 1995) .

- Other studies conclude that environ mental innovation is the result of market pressures causing firms to become more efficient.

- Several techniques exist for managers to map the environmental impacts along the supply chain, such as life cycle assessment, product stewardship, and design-for-the-environment principles. RL linkage to these practices is very common.

Socio-Environmental Performance

- RL eases pressure on the harvest of raw material and reduces the related environmental degradation associated with raw material extraction and processing.

- In addition, the lack of landfill availability and the rising landfill tipping fees and trash collection fees to households, may initiate a movement by consumers away from products that cannot be recycled, further aiding community economic and environmental development.

- The development of 'take-back' programs and recycling days in communities is heavily dependent on effective reverse logistics chains.

- The markets for many these returned products may not be lucrative, causing greater burdens due to possible backlogs of products that need to be disposed.

Policy Implications

- RL promotes recycling, reuse, and resource conservation and in doing so, it addresses various aspects of social sustainability.
- Can government policies focus on RL as a means of promoting social sustainability? If so, what policy options exist?
- What are the policies that can promote reverse logistics and how should these policies be implemented in order to enhance social sustainability?
- These are policy questions facing communities in dealing with and developing RL.

Discussion and Conclusions

- A caveat to our findings and discussions is that social sustainability can be greatly influenced by various regional and cultural characteristics.
- Cultural, legal, social, political and a host of other macro-environmental variables will differ by location.
- Some of the results here that are pertinent to certain regions may not be fully applicable to other regions and locales. Even though we tried to generalize, the relative diversity of norms has to be taken into consideration when seeking a more complete evaluation.
- In fact, cross-cultural investigation of the veracity of our review is needed. Additional research questions are now introduced.

Areas for Future Research

- Future research should concentrate on theory building to develop comprehensive social sustainability models for reverse logistics and to effectively place RLSS within the development of a sustainable supply chain theoretic paradigm.
- separate theoretical models may be developed for the social sustainability field and should link the many RL practices. These models and theoretical suppositions should be tested and augmented with confirmatory examples from practice in industry.
- Existing research that has quantified the costs or studied the efficiencies of RL supply chains should extend these studies to include social sustainability implications.

Areas for Future Research-Continued

Some examples of research questions and theoretical linkages include:

1. Are organizations considering and evaluating the more complete social sustainability parameters of RL?
2. Are more appropriate frameworks available (or need to be developed) for investigating the relationship between RL and social sustainability?
3. Does CSR include and incorporate the end-of-life or service level of the value chain (Porter and Kramer, 2006).
4. What drives or prevents social sustainability measures and considerations within organizational RL functions?
5. Does resource dependence with other members of the supply chain play a prominent role (Carter and Rogers, 2008)?
6. Does stakeholder theory extend to RL practices?
7. What are the roles of various institutions in motivating organizations (Zhu and Sarkis, 2007)?

Areas for Future Research-Continued

1. In terms of capacity development and building, what are the tangible and intangible resources that are required to help incorporate social sustainability measures into RL activities?

2. From an employment skills perspective, investigation of worker training, learning and skills development in an RL environment is needed to determine workers' skills portability to other RL functions and long-term job security.

3. Most importantly for organizations, what is the critical aspect of RL social sustainability relationships? Do they result in improved financial , operational and general business performance? The investigation of these relation ships is one of the basic ones related to whether 'doing good means doing well'.