

5th International Workshop - Advances in Cleaner Production
São Paulo - Brazil - 20th to 22nd, May - 2015



Design of Cleaner Production Frameworks: an Operational Tool for Sustainable Transition

KHALILI, N. R.^{*a}, ROA-GUTIÉRREZ, F.^b, CHÁVES-ABARCA, R.^c, JAUBERT-SOLANO, W.^d, VALERIO-VINDAS, J.J.^e

Associate Professor, Environmental Management and Sustainability Program, Stuart School of Business, Illinois Institute of Technology. Chicago, IL 60616, khalili@iit.edu

Profesor, Environmental Engineering Program, Chemistry Department Chair, Instituto Tecnológico de Costa Rica. Cartago, froa@itcr.ac.cr

Instructor, Agribusiness School, Instituto Tecnológico de Costa Rica, Cartago, rchaves@itcr.ac.cr

Adjunct Professor, Business School, Instituto Tecnológico de Costa Rica, wjaubert@itcr.ac.cr

Lecturer, Industrial Production Engineering Program, Instituto Tecnológico de Costa Rica, juvalerio@itcr.ac.cr



PATHWAYS
— to Prosperity in the Americas —



Academic Work

Agenda

1. Project goals and objectives
2. Methodological approach
3. Costa Rican Pilot
4. Assessment of the company's perception of CP and CSR initiatives
5. Country sustainable development goals and objectives
6. Proposed strategy for designing sustainability focused RECP in Costa Rica
7. Conclusion



Project goals and objectives

I. Demonstrate how strategic planning for sustainability can be operationalized by developing a stepwise framework for design of CSR specific, and resource efficient CP initiatives;

II. Discuss why design of the framework should account for the purposes and the focus of the local and regional sustainable economic development goals and objectives;



Project goals and objectives

III. Emphasize the importance of developing policies that can promote understanding and adoption of CSR focused, resource efficient CP initiatives while targeting both internal and external stakeholders; and

IV. Demonstrate how design of the frameworks utilizes synergy among management strategies embedded in the premises of the CP and tactics intended in CSR initiatives.




Methodological Approach

The proposed methodology provides opportunity to simultaneously address business profitability, social welfare and human capacity development needed to ensure a sustainable transition from millennium development goals to those defined by sustainable development goals and objectives.



Methodological Approach

- Design of a systematic step-by-step framework can to enable companies, particularly, small and medium size enterprises develop and asses their sustainability programs and initiatives.
- In another word, evaluating/managing their operational economic and sustainability risks/benefit by adopting (institutionalizing) resource efficient and sustainability focused CP strategies .
- **Note Sub-topics Tools in Figure 1** 



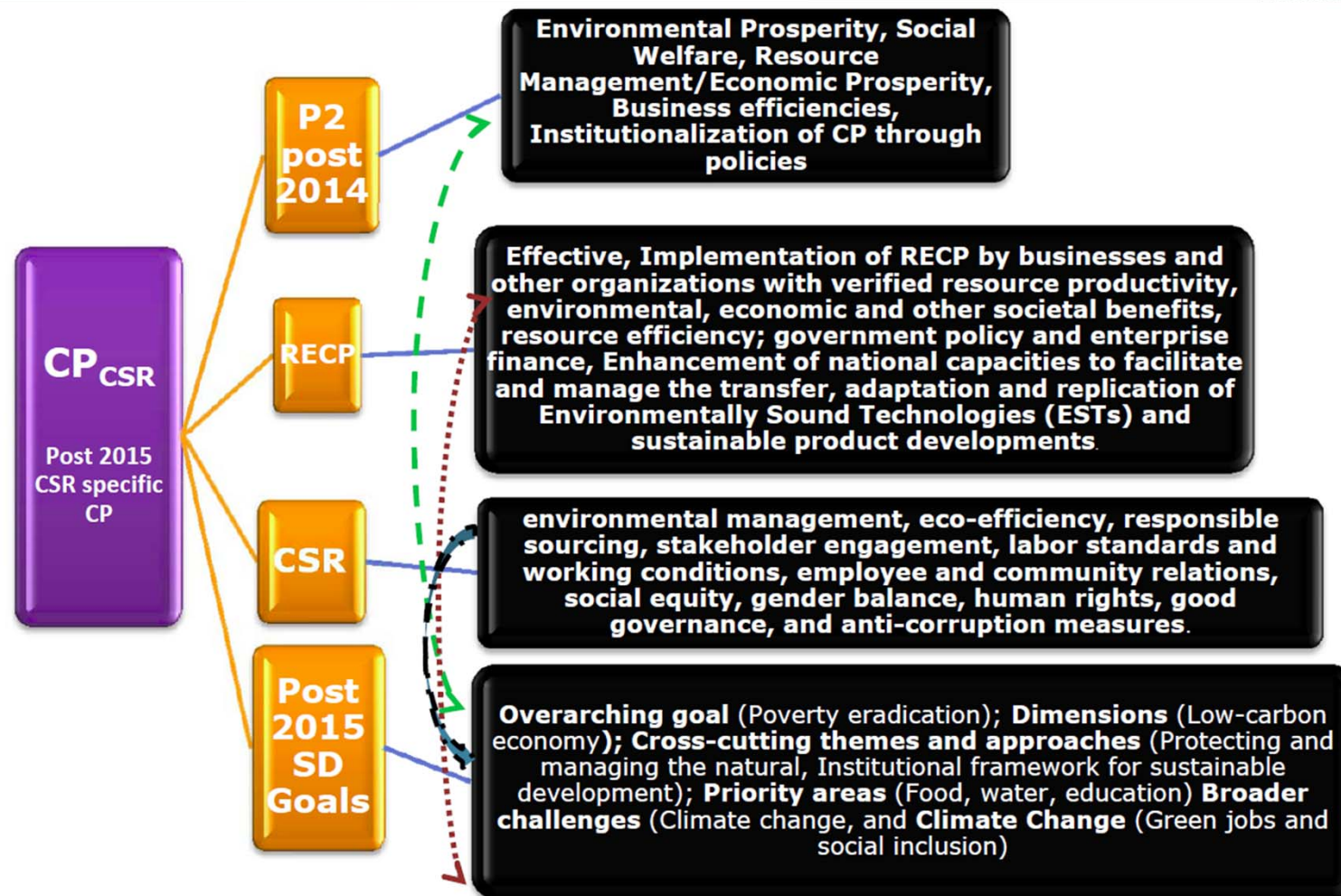


Fig. 1. Sustainability infused tools for Sustainable transition
(reduced version of tools definitions)



- **Step 1:** Identify existing/institutionalized regulatory or voluntary programs, policies, particularly those aligned with environmental, economics, and social aspects of firms operation such as CP:
 - CP is in place (Yes NO)
 - CP embedded in business policy (Yes NO)
 - Social and environmental initiatives in place (Yes NO)
 - If yes identify types of CP initiatives (types of projects)
- **Step 2:** Identify existing/institutionalized regulatory or voluntary programs, policies, particularly those aligned with environmental, economics, and social aspects of firms operation such as CSR:
 - CSR is in place (Yes NO)
 - CSR embedded in business policy (Yes NO)
 - Social and environmental initiatives in place (Yes NO)
 - If yes identify types of CSR initiatives = indicators of CSR initiatives (types of projects)



- **Step 3:** Identify cohesiveness among CSR and CP guideline/focus/interest in the company
- **Step 4:** the need of optimizing alignment of the micro and macroeconomics objectives with expected outcomes of CP or CSR initiatives.
- **Step 5:** Anticipate/ assess impacts of implementing CP-CSR on the economics of the company, country, (within which company operates) and the region if applicable.
- **Step 6:** Identify constrains for example: lack of financial resources, need for creation of knowledge, supporting government policies, alignment with country/regional development goals, financing opportunities in collaboration with international agencies and private industry.
- **Step 7:** Prioritize constraints and address those most influential to financial success of the company, state of the economy and social development in the country/region.



Application in Costa Rica:



Assessment of the company's perception of CP and CSR initiatives

- Most companies had clear understanding and knowledge of what CP and CSR are and their values for the company.
- Most companies valued CSR for the company more than CP.
- Lack of government assistance, effective public policies, and external financial assistance were three most important barriers for adoption of any type of CSR or CP strategies.



Assessment of the company's perception of CP and CSR initiatives

- Companies also emphasized on the importance of educating both consumers and employees about values of CP and CSR: stating that enhancement of the CP or CSR focus and initiatives require training for employees.
- Although almost all companies indicated that CP is important, but a very few had CP in place due to capacity constraints and need for high levels of paper work.
- Universally companies believed that adoption of CSR and CP would be increased substantially in the future. CSR more than CP (Figures 2).



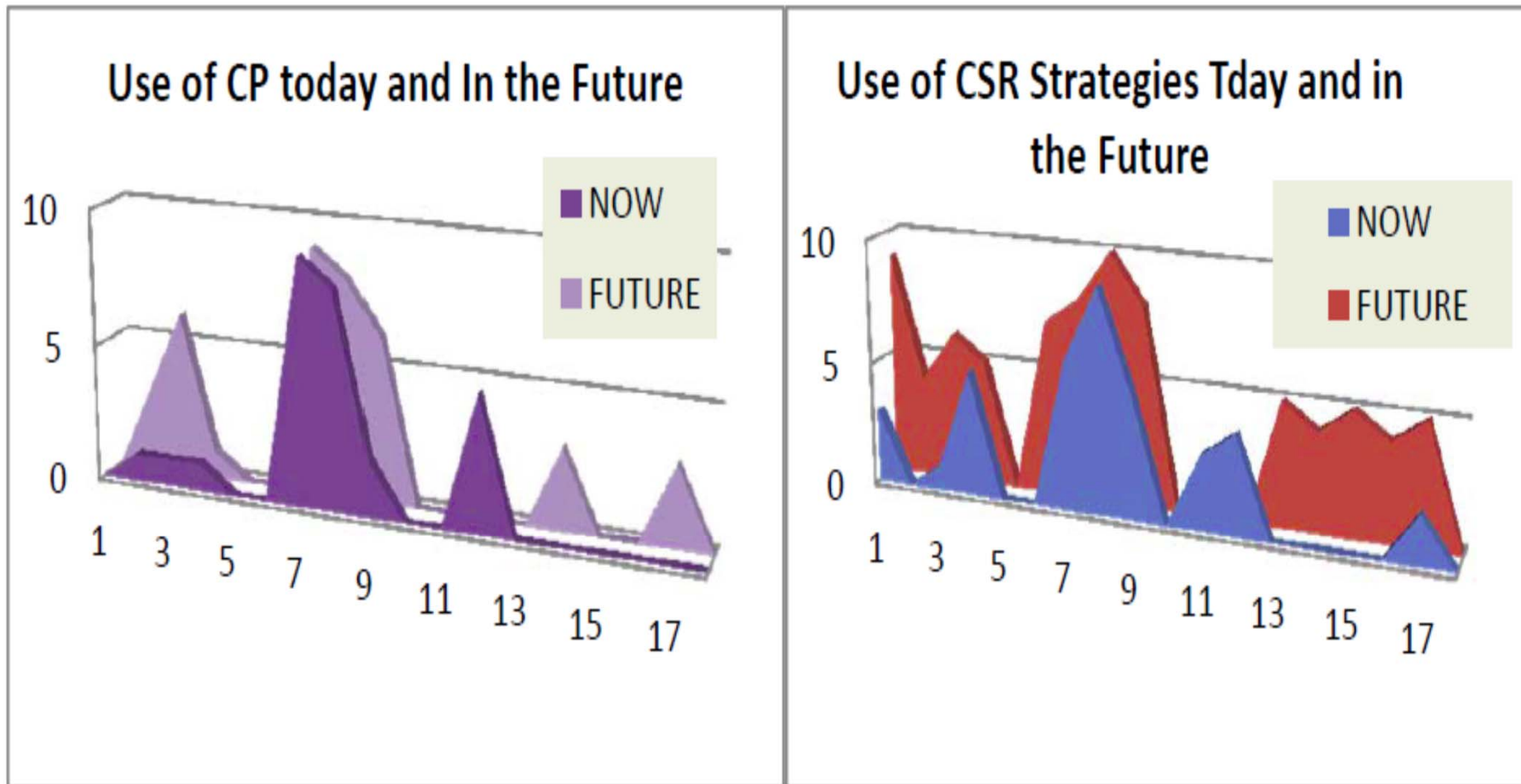


Fig. 2. Expected change in adoption of CP and CSR today and in the future



Country sustainable development goals and objectives

Report that was published by World Bank for Costa Rica in June 2014 (data in the report was obtained by surveying 310 stakeholders of the World Bank Group in Costa Rica. Stakeholders were invited to provide their opinions on the WBG's work in the country.). Results of data analysis in summary were as follows:

- **70% indicated that country is in right direction, while across all stakeholder groups, “transport” was considered to be the top development priority in Costa Rica.**
- **Respondents across stakeholder groups and sectors all agreed that development in “*job creation and employment*” would contribute the most to poverty reduction in Costa Rica.**



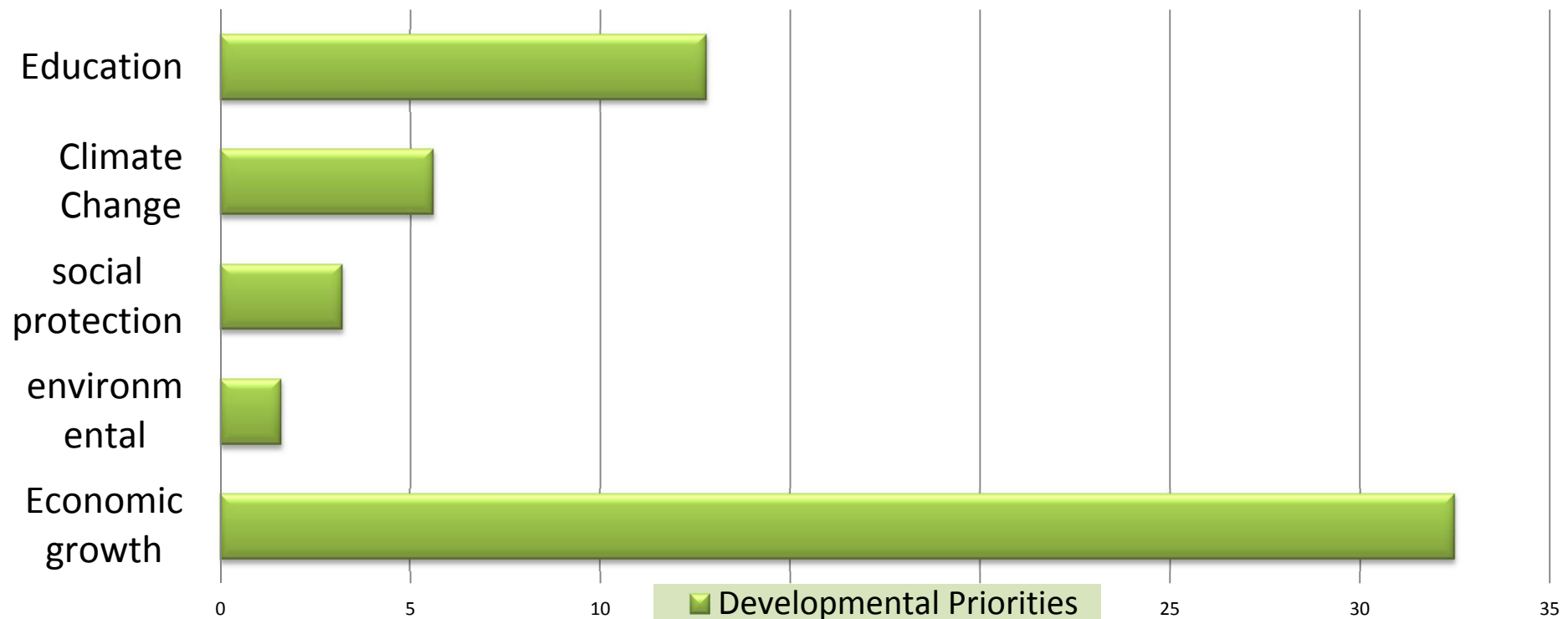
Country sustainable development goals and objectives

- Respondents across sectorial areas agreed that development in “*transport*” would contribute the most to economic growth in Costa Rica (60 % of responses) followed by “*Foreign direct investment*”, “*trade and export*”, “*employment*”, “*public sector reform*”, “*domestic private sector development*” and “*education*” (41, 36, 24, 22, and 19 and 13% respectively).
- Factors contributing to shared prosperity included better “*entrepreneurial opportunities*”, “*education and training*”, “*better ensured job opportunity*”, and a “*consistent economic growth*” (according to the 47, 40, and 31% of responses, respectively).
- General analysis of the survey also suggested that at country level the most influencing parameters seems to be “*need for economic growth*” and “*education*” followed by addressing “*climate change issues*”, “*social protection*” and “*protection of environmental systems*” (Figures 3a, and 3b).

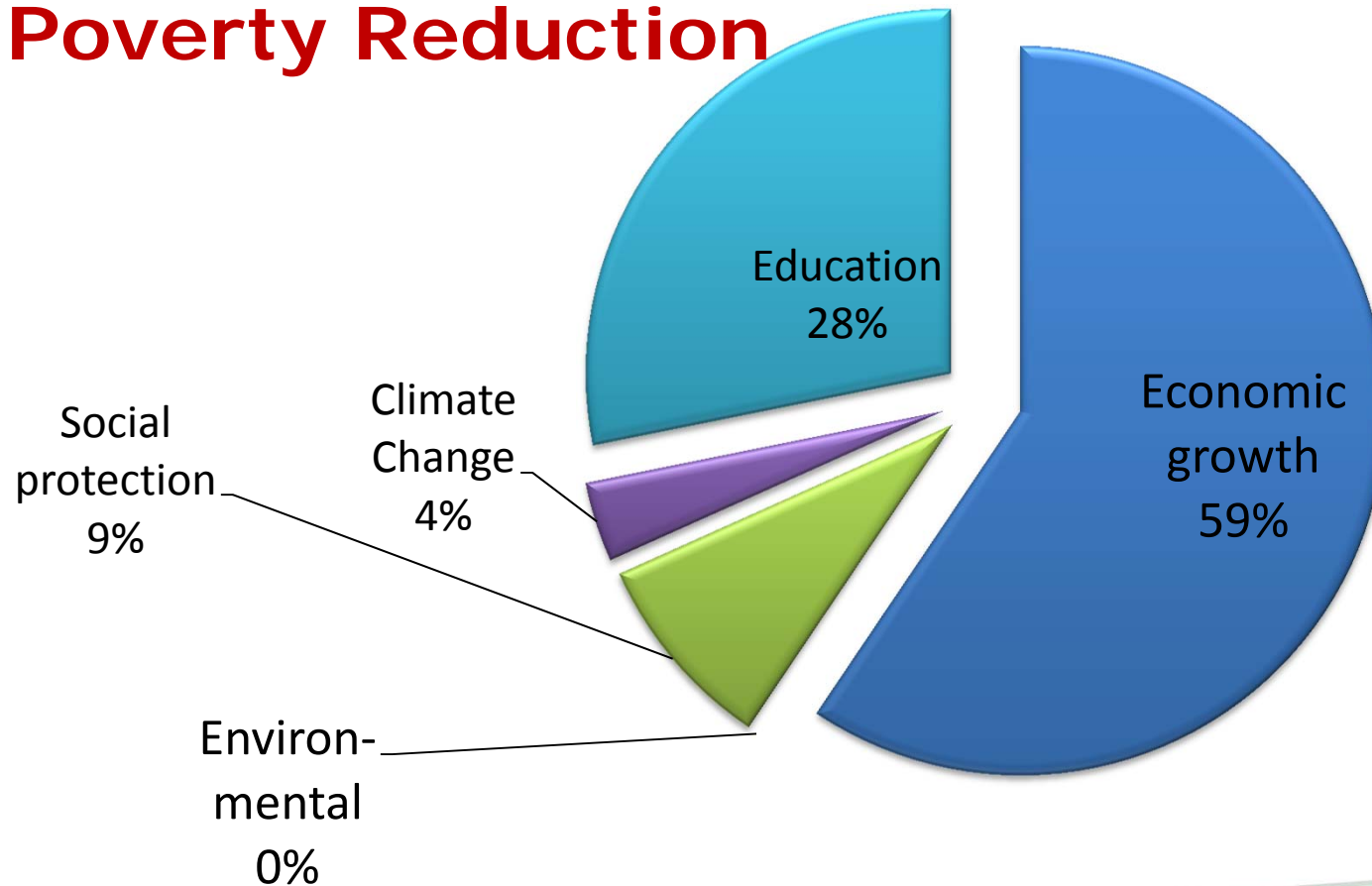


Regional development goals

3a. Developmental Priorities % Contribution



3b. Programs for Poverty Reduction



Proposed strategy for designing sustainability focused RECP in Costa Rica

- Application of the proposed framework accordingly is proposed in in pilot study for Costa Rica **utilizing macro and micro level data provided by the World Bank and those obtained through simple questionnaires.**
- Data collection and analysis was conducted in collaboration with the faculty at Instituto Tecnológico de Costa Rica.
- Upon completion of our data collection and analysis, while utilizing steps similar to those involved with proposed strategic design presented in section 4, we suggest design of CSR specific RECP to include the following steps:



- **Focus on Company Internal Factors:**

- Enhance employees' knowledge of sustainability (CSR) and environmental management strategies (RECP) and their impact on company performance (*Education and training for internal stakeholders*)
 - Focus on using business efficiency as an indicator for selecting best approaches to design of CSR or RECP strategies for the company (if company already has CP programs use it to develop CSR strategies for the company)
 - Institutionalize RECP practices which could address CSR goals and objectives by including those in core business decision-making processes;
- **Identify company resources and assets that can support implementation of the RECP, CSR, or combination of both initiatives**

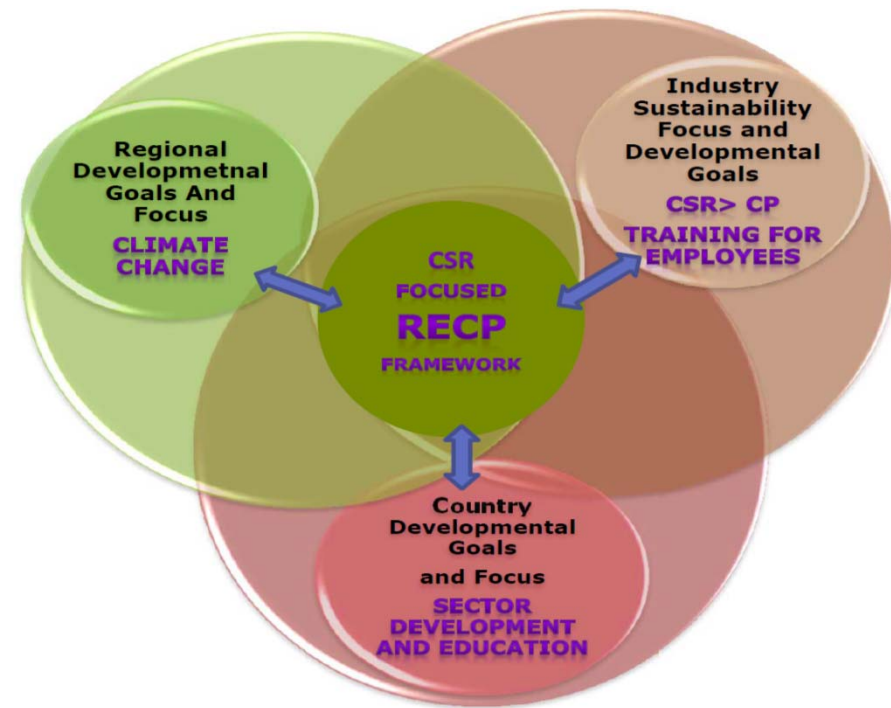


- **Focus on Company External Factors Should be on:**
 - Country Level assessment of the regulatory systems/approaches and benefits (subsidies), and policies that could provide assistance with implementation and financing RECP options.
 - Identifying the levels of uniformity among company's CSR or RECP strategies with those identified by country and Regional strategies for meeting sustainable development goals and agendas post 2015a.
 - For example consider business efficiency, economic development, education, and energy efficiency/use of renewable the primary focus of the company



Proposed strategy for designing sustainability focused RECP in Costa Rica

- Developing the framework or guideline in consultation with the internal and external stakeholders.



- **Fig. 4.** Design elements of the sustainability (CSR) specific RECP (*regional and country specific focus were selected from U and WB reports*)



Conclusion

- With the challenge of sustainable development becoming as considerable as ever, paper highlights ***the importance*** of considering ***social and economic prosperity indicators in the design of resource efficient CP strategies.***
- While pointing out the values of the advanced environmental management and sustainability tools and guidelines, such as those associated with P2 post 2014 guideline, RECPs, CSRs and post 2015 SD goals and objectives, authors underscore the importance of designing CP strategies according to a framework that is sensitive to ***both micro and macro level economic development goals and objectives*** of the organizations.



Conclusion

- Similarly, paper is emphasizing ***the significance of understanding organizations' internal and external dimensions as well as resources and constraints*** prior to approaching design of the framework.
- Results of the case study in Costa Rica suggest that success of the sustainability focused CP initiatives require ***understanding of the organizations internal and external environment (country, region), developmental goals, objectives, and initiatives such as those concerned with providing financing mechanisms in support of sustainability initiatives.***
- The role of the education and awareness of the importance of sustainability is also valued as a strategic tool for a sustainable transition.



Acknowledgement

- The authors are solely responsible for the contents of the article, they would like to acknowledge the support of the :
 - (I) “Pathways to Cleaner Production in the Americas” project in development of CP activities at their university (ies) (This initiative is funded by the U.S. Department of State under the Pathways to Prosperity in the Americas initiative, through Higher Education for Development (HED) and
 - (II) IIT Stuart School Center for Strategic Competitiveness.



São Paulo - Brazil - May - 20th to 22nd - 2015



Academicth

INTERNATIONAL WORKSHOP
ADVANCES IN CLEANER PRODUCTION

“CLEANER PRODUCTION TOWARDS A SUSTAINABLE TRANSITION”

TEC | Tecnológico
de Costa Rica

ILLINOIS INSTITUTE
OF TECHNOLOGY

Pathways to
Cleaner Production
in the Americas
Caminos hacia la
Producción más Limpia
en las Américas

Thank you

Gracias

Obrigado



PATHWAYS
— to Prosperity in the Americas —



25
Academic Work