

Financial Gradients

A Financial Mechanism
for Climate or Sustainable
Development Action



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Financial Gradients: a financial mechanism for climate or sustainable development action

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Abstract

The present debate in Climate Finance is whether there is a misplaced focus on public sources of funds from developed countries, instead of looking at investment grade financial resources. In other words, financing climate action via public funds is proving to be a constraint. Similar constraints also exist in programmes for Energy Access using Renewable Energy and other resources in the sustainable development domain. To address these constraints, financial and business strategies are often developed. While analysing such strategies, the concept of “financial gradients” emerged. This paper espouses the idea of financial gradients, which is a potential methodology for a financial mechanism for sustainable development action.

Financial gradients can be an answer to addressing investment-grade climate action issues. It can be thought of in three different ways, first, as an approach to analyse financial flows in programmes or projects in the sustainable development space. It can come up with key financial indicators, which can point towards the health of the programme or project. Financial gradients can also act as a tool by which individually volatile sources of finance can be combined together to generate a single long-term and stable inflow of finance to fund a programme in sustainable development. Another way to describe financial gradients is as a financial mechanism to help in creating long-term strategies with the help of both business and financial models to sustain the programme or project. This paper will concentrate on financial gradients as a potential approach in a sustainable development programme.

Introduction

True climate action will be a large task, it may well involve an overhaul of the way we live, the way we use energy and other resources, in fact the way we use our planet. Of course, the financial support required to take this action will be extremely large. The International Energy Agency has suggested that for the energy system overhaul alone, the amount required will be US \$10 trillion over and above business as usual (Matthews J A *et al.* 2010).

However, it should be understood that money alone cannot solve the problem. There are large associated risks. Uncertainties can be of various types, for instance, scientific uncertainty, e.g. about climate sensitivity, feedback effects, and so on; market uncertainty like fuel price volatility; technological uncertainty e.g. availability of renewable technology; socio-economic uncertainty, e.g. development of different macroeconomic factors or policy uncertainty, e.g. about commitment to specific targets and stability of CO₂ prices (Fuss S *et al.* 2010).

Financial gradients

- An approach
- A tool
- A mechanism

The present focus in climate finance – misplaced

We know that given the uncertainties and the scale of financing required, innovation is crucial. Therefore, to address the problem, a trend to innovate financial options for climate action has evolved, and one such is discussed in this paper.

There is a simple underlying argument in this paper. The problems of financing climate action all over the world were also the problems faced by a programme for Energy Access using Renewable Energy (more details in the case study below). A financial gradient understanding was developed during the analysis of the programme, which could be very helpful in three ways. First, as an approach to analyse financial flows in programmes or projects in the sustainable development space—it can come up with key financial indicators, which can point towards the health of the programme or project. Financial gradients can also act as a tool by which individually volatile sources of finance can be combined together to generate a single long term and stable inflow of finance to fund a programme in sustainable development. Another way to describe Financial Gradients is as a financial mechanism to help in creating long term strategies with the help of both business and financial models to sustain the programme or project. This paper will focus on financial gradients as an approach in a sustainable development programme.

“A blinkered focus on incremental costs of mitigation in developing countries and what is needed in concessional public finance from developed country governments, seems ultimately to be unhelpful—and at the root of the impasse in international negotiations. A focus, instead, on securing the finance needed for green investments that provide light, heat, cooling, mobility, and secure forest ecosystems—the things that populations really need and private businesses can be central to the delivery of—seems to be a much more positive and hopeful approach. Surely, the exact nature and amount of public sector support from developed countries that has enabled this to happen is of secondary importance to the fact that these investments do happen in measurable and verifiable ways” (Ward 2010).

This is a pertinent insight; and it is true that 80% of all global investments emanate from the private sector (UNFCCC 2007). Instead of being viewed as the prerogative of some global government, climate action can better be looked upon as an investment opportunity. However, another issue that should be addressed is primary risk. **Primary risk** is the sum total of all the risks climate action entails, coupled with the risk of doing it the first time. The paper (Ward 2010) itself alludes to the fact that private investments will not go beyond implementation risk unless, of course, some financial model provides an exceptional return. Given this primary risk, it may well be that only certain sources of finance can bear this risk; public financial sources from developed countries are the sources, which come to mind immediately. The crucial thing to note here is that this source will not be there indefinitely, and all climate actions need adequate and expected financial flows in the long run. This conundrum can be solved with correct business and financial modeling of climate projects. Financial gradients is one such approach, which envisages business and financial

models made with inherent understanding of the dynamic nature of the sources of funds. In simpler terms, financial gradients enable us to make business and financial models, which help in undertaking long-term climate action as it converts different financial sources (which by themselves might not be adequate or dependable) into one, which is predictable, stable, and adequate.

The source of finance for climate action emerges as one of the most discussed issues in climate finance. The sources of climate finance can be broadly clubbed as bilateral, multilateral, public, private or philanthropic. Within negotiations, the focus of finance for climate action has largely been on public sources located in developed countries. Given the recessionary pressures on many parts of the world, finances in the form of private investments can be tapped instead (UNFCCC, AGF report 2010; Ward 2010), especially as 86% of all global investments emanates from the private sector (UNFCCC 2007). Tapping and tracking financial flows for climate action becomes difficult without a set definition of climate finance (Buchner *et al.* 2011).

Defining climate finance

Climate finance is that finance, which is made available to fund actions, which are adjudged climate actions under the ambit of UNFCCC (treaty) and the nature, sources, and requirements of this finance can be notably varied.

(This definition will be followed while talking about climate finance in this paper.)

Figure 1 attempts to gauge current financial flows for specific climate action. This figure is based on a tracking of finance flows in 2009–10, amounting to US \$97 billion in areas ranging from climate resilient development to low carbon initiatives. The study found that contrary to possible expectations the amount of finance available from private sources was three times more than public sources. Additionally, carbon finance (mostly to do with mitigation efforts with interplay of market mechanisms) is found to play a miniscule role in the overall climate finance space. The study further revealed that US \$74–87 billion of the US \$97 billion could be classified as investment rather than the incremental cost contribution in the climate action domain. Furthermore, the study indicates that a huge majority of climate finance (US \$93 billion of the US \$97 billion) was for mitigation centric activities, leaving very little for adaptation action. However, we have to look at the CPI (2011) paper with some caution; we know that renewable energy investments alone were well in excess of US \$100 billion for the 2009–10 period (BNEF 2010). Is investment in renewable energy not climate action; these issues can get sorted out when we have a proper definition of climate action—the above definition can be a starting point to comprehend financial flows in climate action better. The earlier definition is the first attempt to define climate finance. It is understood that as various aspects and branches of financial flows will emerge; the definition will help set a context to the previous statement.

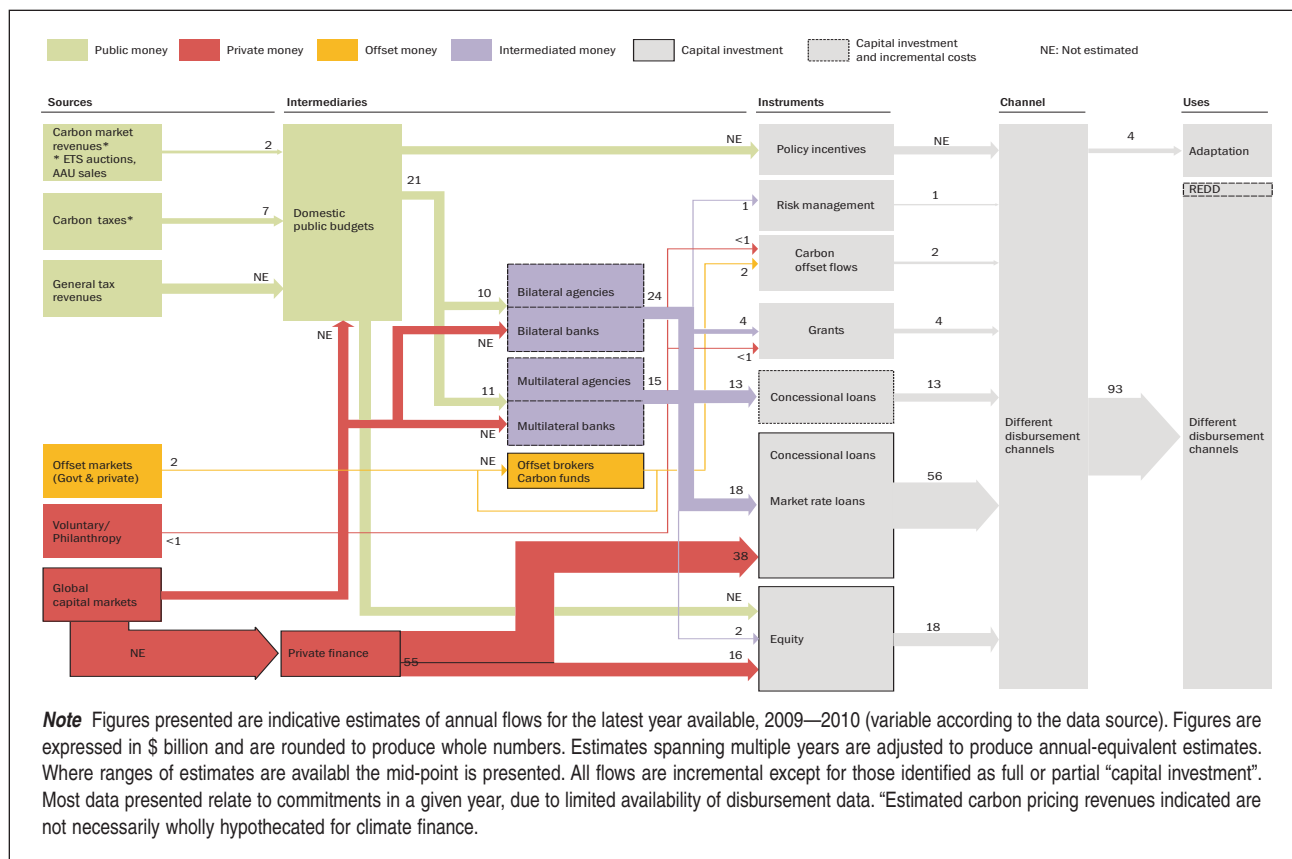


Figure 1 Current climate flows (in \$ billion) (CPI 2011)

Source Buchner *et al*, 2010, The landscape of climate finance, CPI report <http://unfccc.int/files/cancun_agreements/green_climate_fund/application/pdf/submission_by_cpi_on_climate_finance_landscape_excerpt.pdf>

We also have to note from Figure 1 that the maximum volume of finances are in the private sector, and more importantly, if we categorize financial inflows as investment grade (whether the origin is public or private in nature), then this is over 80% of the inflows. The inference is simple—to increase the volume of climate finance the projects and programmes in this domain have to become investment grade.

One way to convey the message of ‘investment grade’ is that the projects or programmes in sustainable development domain have to be financially sustainable as well. As we have said earlier that one method to enable sustainable development projects to become financially sustainable is financial gradients.

The genesis of financial gradients

While analysing financial data for a sustainable development project, there was a need to structure the sources of finance. It was noticed that while sources of finance for the corporate sector were well researched and theorized and now an established subject called corporate finance; the same could not be said for the sustainable development sector. It was also seen that not only were the nature of projects different, the sources of finance also had different natures: some adhering to conventional norms, while some sources of finance were particular and peculiar to the sustainable development field. Then, sustainable development projects

were traditionally thought to be financed only with public finance or grants and aid, however, overtime and certainly in recent times, there was a need to attract other sources. Sometimes it was felt that the nature of the same source was changing as well. For instance, public finance, which primarily consists of government money with fiscal objectives was becoming more in the nature of soft loans. Overall, there is a general tendency of the nature of finance in this sector to move away from developmental objectives to an investment category of financing.

It was also felt that financing of sustainable development projects start with an emphasis on grants; however, if the project has to sustain over long periods of time, then the project should also be financially sustainable. It was noticed that grants were particularly volatile in nature, and in recent times it is increasingly so. There are serious issues the world over with the availability of public finance as a pure expenditure source, with governments wanting to cut down public expenditure, and grants are also increasingly difficult to avail. Here, we are not saying that the project should be profitable, but merely saying that for the project to continue there should be enough financial inflows to carry on with the project. Then sustainable development project will last over a long time—at least for 25 years or longer. They will have time spans commensurate with major infrastructure projects. However, if the financial backing was being availed only via grants, then it will be difficult to move beyond a three-year time horizon and the project will die an untimely death. In order to avert such a situation, project managers will have to adjust their financial sourcing mechanism, or in other words to look for a more **diffused financial mechanism**, where the share of non-grant or non-public finance sources increase. This, if we view this as a series of yearly bar graphs where the amount of money is on the y-axis and sources on the x-axis, then in the initial years, the slope or gradient will be steep as one moves from grant participation to say, private equity participation in the project. However, the slope will become more gradual after a few years of the project being in existence. This will be indicative that the project is working well and is attracting investments on its own merits. *Financial gradients can be indicative of the long term viability, sustainability, and acceptability of the project.*

Diffuse Financial Mechanism

Financial gradients: a method for financing sustainable development and climate action

To develop a financial theory on programmes or projects in the domain of sustainable development is a daunting task. Nonetheless, in this paper, an attempt is made in that direction. The recent financial crisis of 2008 has challenged conventional positions in finance. A pertinent conventional view point is elucidated in the Modigliani-Miller proposition (Modigliani and Miller 1958). It is present in all corporate finance text books, and is considered seminal work in capital structure of the modern corporate. It has served its purpose especially in the corporate sector (Merton H Miller 1988); however, in the wake of the 2008 financial crisis, this proposition has to be understood in a new light—many papers allude to this topic with various entry points; for instance, one looks at it from an entrepreneurial angle (Kotch *et al.* 2010); or from the more holistic viewpoint of mortgages (Ostaszewski 2009)—the outcome of these papers point towards the premise

that the nature and sources of finance are important and are crucial from the institutional and extremely important from the governance points of view. The Modigliani-Miller proposition assumes symmetric information and efficient markets. However, given the present scenario, the previous assumptions may not be as valid as originally inferred.

An inference can be drawn that the nature and sources of finance play a crucial role in the process of value creation, both at the firm level and more importantly at the institutional level.

Sustainable
development in climate
finance: common goal

Another facet of this paper is sustainable development. Sustainable development has evolved over the years, after much deliberation, to include three most crucial aspects of human welfare—economic, social, and environmental—it also includes all common areas between them. Sustainable development has induced a change in thought from a singular focus on economic growth to a more multi-faceted approach. And since the formulation of Agenda 21 in 1992, adopting a development path on the principles of sustainable development has become the goal for huge majority of countries around the world (Kumar 2011).

Given the new challenges of the financial world and the emergence of the concept of sustainable development, projects and programmes in the domain of sustainable development have to be structured and thought about in fresh perspective. In this paper, the focus is on looking at the capital structure of these projects or programmes.

The method of “financial gradients” is the understanding of the nature and sources of finance. Inherently, a financial commitment is made for a particular purpose, also the mix of finance in a particular project can guide the results or outcomes, particularly at the institutional level. As we have seen, a seemingly innocuous debt-equity ratio, if not interpreted correctly can cause a global financial crisis. In considering the financial aspects or interactions, the nature of finance with the source of finance are the most important, the change of capital structure over time, the nature of the business model, and so on—all can be considered—but, the essence of financial gradients lies in the understanding of these interactions. In other words, there are different aspects or factors in financial theory. These aspects of factors interact with each other, but the most important interactions for financial gradients is the interaction of nature and sources of finance.

Each case, programme or project will have its own story and its own set of priorities, but in the financial sense and specially in the context of sustainable development, the nature and sources of finance are at the core.

A case study below will explain this further. There we will see some interesting notions emerging, for example, *financing sources like grants, which have low monitoring requirements are actually very expensive; as here the project implementer will have to figure out monitoring mechanisms and pay for it. However, in case of equity, which has the highest monitoring requirements, as a source of finance is much less expensive, as the equity investor will monitor the project on his or her own self interest, so the costs of the project implementer for monitoring requirement is virtually reduced to zero.*

Financial gradients as an approach

Let us recall that financial gradients can be seen as an approach to analyse financial flows in programmes or projects in the sustainable development space. It can develop indicators to assess the health of the project. We can infer that the health of the project is good if the key challenges are met while the project is running. Financial gradients as an approach is described below as a case study for a project in the sustainable development field in the initial years of its activity.

Case Study*

The key challenges will be addressed and then the analysis will follow using financial gradients approach.

The key financial challenge to implement projects in the sustainable development space is to secure long-term, stable finances. This challenge can be broken down to two parts (particularly for non-governmental implementation of projects). First, how does the project diversify the sources of funds; and how does the project scale up funds from all the sources.

Given these challenges, it can be said that a programme or project in the sustainable development space has attained credibility in terms of its financial and business models, if there are positive trends in two key financial indicators. First, the overall financial inflows have to increase from all sources—this is particularly true when a project has just started and scaling up is an inherent programme-level requirement. Second, over time the sources of finance should be diversified. Therefore, over time the percentage share from different sources should trend towards a more equal distribution.

The project used to describe financial gradients as an approach is in the space of Energy Access using Renewable Energy and is referred to as EAuRE hereafter.

EAuRE funds have been generated through a range of financial instruments, which largely include grants, but also equity investments, loans, syndication, payment for services, research grants, and so on.

Apart from the two key challenges, there are a wide variety of questions, which come up and a few relevant ones are given below:

- How can the financial flows for the EAuRE campaign be analysed and trends interpreted?
 - Is there an increase in the volume of financial inflows in the project?
 - Is there diversification in terms of the sources of finance?
- Do the trends show progress in financial viability and sustainability of the business model developed by EAuRE?
- To what extent is EAuRE leveraging private finance?
- What is the nature and quantum of public finance being leveraged by EAuRE?

To answer the above questions, financial gradients as an approach will be put to use.

* All details in terms of data analysis and figures given here are only for exposition. The case study has been developed with the help of the data available from TERI's Lighting a Billion Lives[®] initiative. For further details on the LaBL initiative, refer to the web site <<http://labl.teriin.org>>

Now, using the financial gradients methodology, capital “inflow” for the EAuRE project will be analysed. For the purpose of this analysis, two schemes of classification have been created viz. **Sources** and **Nature**. Source identifies the entity providing the fund, while Nature gives us the information about the characteristics of the financial inflow, whether it is equity, debt, public finance or grant, and what kind of tax or other kinds of financial implications are attached to them.

All inflow transactions were analysed and clubbed together in different categories within the classes. These were created keeping in mind the sources and nature of the fund. The following table will give out the details of each category.

S.No	Source of EAuRE finance
1.	Bilaterals
2.	Multilaterals
3.	Events
4.	Registration charges
5.	Co-funding
6.	Government
7.	Corporate Social Responsibility
8.	Institutional Social Responsibility
9.	Individuals
10.	Payment for services

The categories were created such that each one is mutually exclusive of the other.

The table below is on the nature of financing.

S.No	Nature of EAuRE finance
1.	Pure grant
2.	Research grant
3.	Loans (soft or otherwise)
4.	Equity (including co-funding)
5.	Public expenditure

Again, the categories have been created such that they are mutually exclusive and give us a clear indication of the evolution of the pattern of financing in EAuRE. The table below sums up the nature of finance with respect to monitoring requirements very specific to the EAuRE programme.

Category	Definition	Monitoring requirement
Pure grant	Funds given as a part of philanthropic activity or partly with an intention just to claim tax exemption	Negligible
Research grant	Funds given with a research objective and a tangible outcome is expected (a report or a product)	Low
Public expenditure/ subsidy	Government funds with fiscal objectives	Medium
Loans	Funds provided by a bank with a ToR similar to retail lending	High
Equity	User/ community/ entrepreneur contribution towards the project hardware cost	Highest

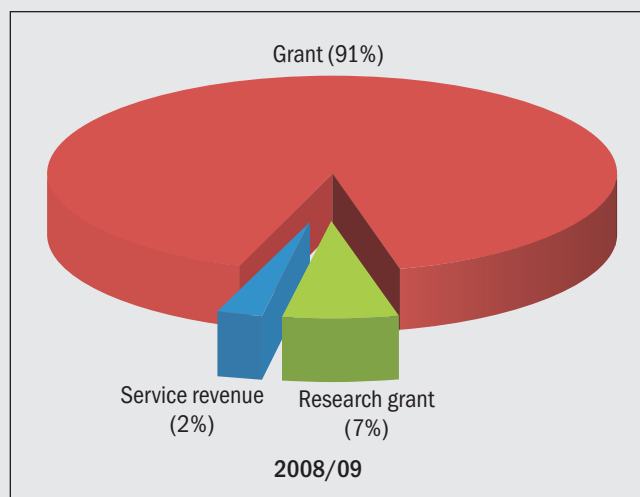
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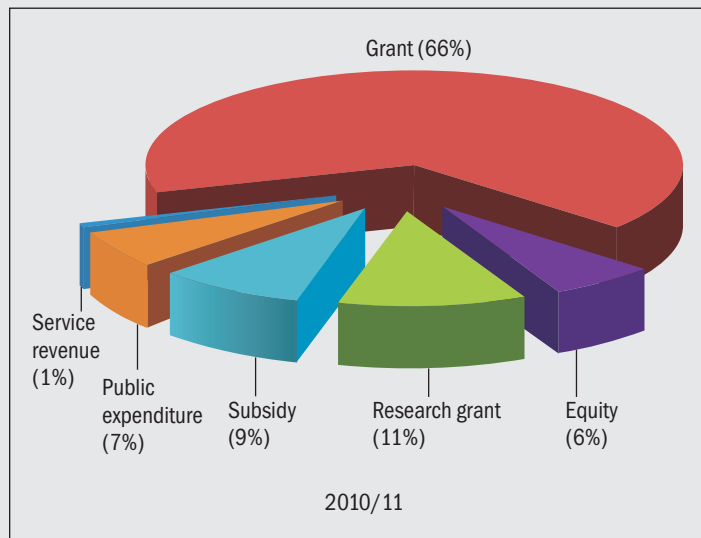
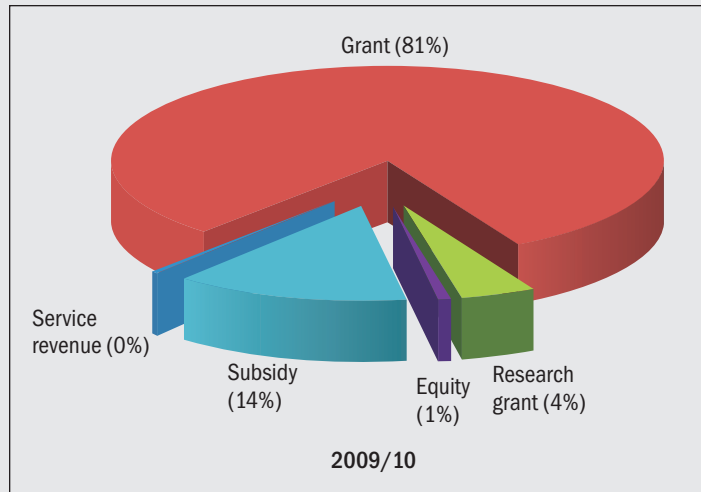
1. Lower monitoring requirements essentially means that the cost of monitoring will be much higher. Reasoning: financing sources like grants, which have low monitoring requirements are actually very expensive; as here the project implementer will have to figure out monitoring mechanisms and pay for it. However, in case of equity, which has the highest monitoring requirements, as a source of finance, is much less expensive, as the equity investor will monitor the project on his or her own self interest, so the costs of the project implementer for monitoring requirement is virtually reduced to zero.
2. One point of information is that a research grant should be interpreted as equity, as the output of the research grant can potentially be monetized and returns can be earned as a result of that. Keeping this in mind then, equity and research grant both should constitute equity.

Case study analysis

The pie charts and the concentric circular charts help us understand the financial trends observed in the nature of funds received by EAuRE for the past three financial years.

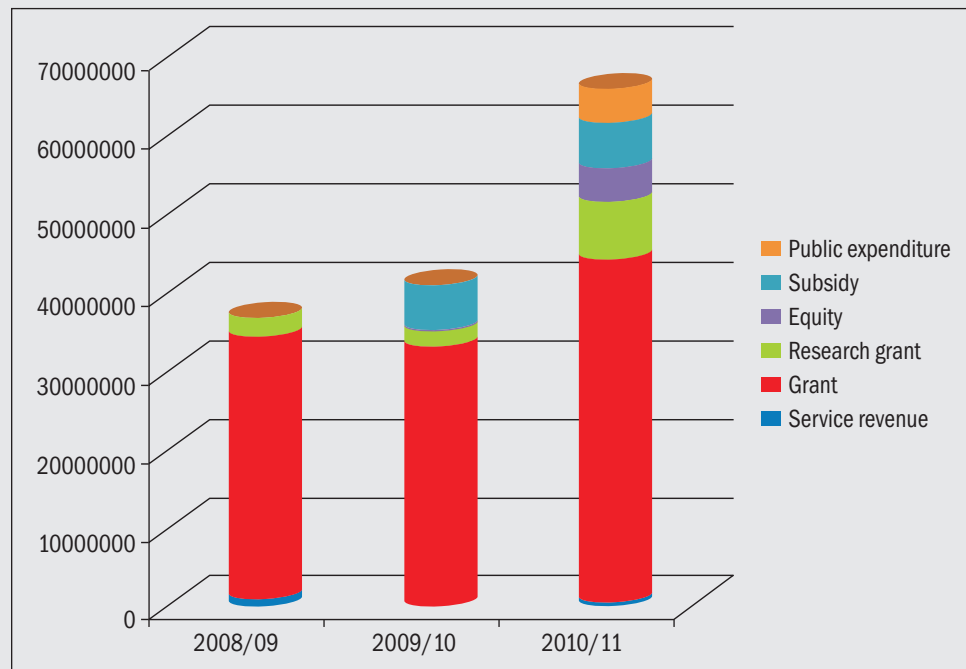
From the pie charts, it can be inferred that there is a movement from a pure grant-based method of financing to a more community or private equity-based method of financing. This equity-driven model will get further impetus when there are more lines of business, like provisions for charging for mobile telephony in addition to charging solar lanterns, are attached to the core model. There are various possibilities of increasing lines of businesses; however, the charts below for the first three years are purely for solar lanterns as the only line of business.





It can be seen from the above diagrams, that in the first year of EAuRE's operation, there was no equity component. This then rises to 1% in the second year and then to 7% in the third year. We also see that the pure grant component is decreasing rapidly from an ominous 91% in the first year to 84% in the second, and a far more viable 65% in the third year. If we add the research grant to pure equity, we find that the equity component is doing very well, from a 7% in the first year to 16% in the second year, and finally a very promising 27% in the third year. Overall, the non-grant finances are rising fast from 9% to 16% and then to 35% in the final year. We should remember that this strong performance in building a sustainable financial model was built with only one line of business; the charging stations have the potential to stand alone as a viable business without any grant component in the future when more lines of businesses are included. Also, we must note that here we have talked in terms of percentages, we must bear in mind that in absolute numbers (or amount of money being allocated for EAuRE) there has been huge increase across all categories.

The picture above is surely a cheerful picture for ‘sustainable’ business models in “real life”.



Inflow in Indian Rupees(₹) from 2008–09 to 2010–11

From the above diagram, we can see that there was an overall increase in financial inflows from year to year, and also we can see that each individual component also saw an increase in magnitude of financial inflows.

Case study: conclusion

There is a clear trend that the grant component is decreasing and the equity component, both pure and in other forms, is increasing. We also see that the total funding across all components is increasing as well.

This definitely augurs well for the EAuRE finance models. There is a clear trend that EAuRE finance is moving from a pure grant-driven financial model to a more flexible model where private or investment category financing mechanisms are playing larger roles.

We can also see that the two key indicators, one of scaling up financial inflows, and second, of achieving diversification from the point of view of sources of finance was also achieved.

Summary

In this paper, we have addressed the central debate in climate finance, and noted that climate action needs to attract investment-grade financing sources. We have also defined “climate finance” to make the exposition clear. “Primary risk” has been noted as a risk concept, which makes a case for public finance and grants in the initial stages for a climate action or sustainable development programme. The paper notes that climate action and sustainable development action has a common goal and financing both has a common problem. To address this problem, the concept of “financial gradients” has been developed.

Financial gradients is a method of understanding financial flows in relation to the nature and sources of these flows. It can give us an indication of the health of a sustainable development or climate action programme. The case study in this paper reflects that it has the potential to develop better understanding of the financial mechanism prevalent in the sustainable development and climate action space. However, much more research needs to be done and many case studies applying the financial gradients method needs to be carried out to make financial gradients a robust and implementable concept.

Next steps: The study of financial gradients as a tool and as a financial mechanism to create strategy for programmes in the climate or sustainable development domain is the logical next step. Also, more discussions on investments vs grants, primary risk, ownership conundrum in climate programmes and so on will follow.

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