

A Framework for Analyzing Science, Technology and Inequalities: Preliminary Observations

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The goals of the ResIST project are to understand the contribution of science & technology to the creation and maintenance of inequality within and between societies; and to develop more inclusive S&T policies that balance growth with reduced inequality and improved accountability to the poor. Inequality is the unequal distribution of something people value, such as income, health, or power. In its dynamic meaning, the word distribution refers to the process of producing and re-producing inequalities. ResIST is concerned with the roles that science and technology play in those processes and how policy can intervene to generate less unequal outcomes.

To understand the dynamics of inequality, ResIST is organized around three types of inequalities: structural, representational, and distributional. These can be briefly characterized as inequalities in individual and institutional capacities, in representation and accountability, and in sharing benefits and costs.

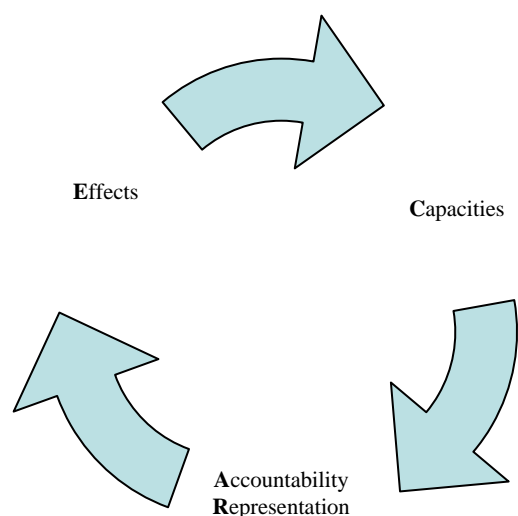
This paper describes the concepts and how they work together, illustrating them with examples drawn from ResIST's first year of work. In 2006-07, the ResIST team consulted with policy audiences in three world regions, heard from them about their local issues and examples,¹ and started work on case studies under three work packages.² This framework paper uses the concepts of structural, representational, and distributional inequalities to link the continuing research in the work packages to what we heard from policy audiences about the distributional issues of relevance to them.

¹ These meetings took place in Maputo, Mozambique (November, 2006); Rio de Janeiro, Brazil (January, 2007); and Istanbul, Turkey (March, 2007). The presentations from the meetings are available on the ResIST web site: <http://www.resist-research.net/cms/site/news/resists-first-world-regional-meeting.aspx>

² Work Package Two, "Policy Tensions in Relation to the Pursuit of Equality: Promoting Scientific Mobility and Balanced Growth," leaders: Louise Ackers (Leeds) and Johann Mouton (Stellenbosch); Work Package Three, "Articulating New Accountability Systems," leaders: João Nunes (CES) and Steve Woolgar (Oxford); Work Package Four, "Distributional Assessment of Emerging Technologies," leaders Susan Cozzens (Georgia Tech) and Mark Knell (NIFU-STEP).

The three types of inequality (Section I) form conditions for each other. High levels of inequality in one contribute to high levels in another; and conversely, decreasing inequality in one can help to decrease inequality in the others.

We see the three types of inequalities as three moments in a cycle of change. Structural inequalities, that is, the unequal distribution of capacities, are a starting condition for processes of distribution. Representational inequalities in politics and socio-economic and cultural activities contribute to inequalities in levels and forms of accountability – that is, to making visible whose interests are embodied in proposed solutions. Structural and representational factors combine to produce inequalities in effects, that is, in the distribution of benefits and costs for various individuals and households. Together, they form a cycle of CARE, a wheel that can spin for better or worse.³ Inequalities in capacity contribute to inequalities in representation, which in turn perpetuate inequalities in the distribution of benefits and costs. Conversely, greater equality in capacity across groups and communities can contribute to more accountability in decision processes that lead to real improvements in basic needs for a broader range of communities.



Policy contexts (Section II). The central challenge for ResIST is to use these concepts to develop tools that would allow policymakers to assess the distributional effects of their knowledge-intensive programs, either prospectively or retrospectively. Their decision environments are complex. They need to take into account external factors, relevant actors, rationales for action, and the instruments available.

This section draws on a review of national policy documents from several ResIST participant countries and on presentations at the three world regional meetings. These countries serve as examples of the various strata of the world economic system and different levels of S&T capability. Mozambique is a low income country; Turkey and South Africa are upper middle income countries and Brazil falls just below the cut-off for this group. The UK and Portugal are both high income countries. While the profile varies across countries, each country has room for significant steps forward in all three areas, and thus for benefits in social cohesion.

Case study contrasts (Section III) and **Policy options** (Section IV). Applications of the concepts in illustrative stakeholder case studies reveal complex tradeoffs and no easy solutions. Yet the analysis of our cases should result in valuable suggestions and proposals for improved policies that reflect greater sensitivity to trade-offs and potential pitfalls. It is clear from our dialogues in national contexts that any solutions developed using the three concepts will need to be tailored to particular national histories and circumstances. Mozambique's current crying need for capacity creates a different set of tradeoffs on accountability than those that would be made in Portugal, for example.

³ An earlier version of this framework was called CAPE, for capacity, alignment, participation, and effects. It was originally developed by Susan Cozzens, Johann Mouton, and Peter Healey. The framework will continue to be developed throughout ResIST.