



## Investing in human and natural capital: An alternative paradigm for sustainable development in Awassa, Ethiopia

Travis W. Reynolds<sup>a,\*</sup>, Joshua Farley<sup>b,1</sup>, Candice Huber<sup>c</sup>

<sup>a</sup> Evans School of Public Affairs, University of Washington, Seattle, Washington, 98195, USA

<sup>b</sup> Gund Institute for Ecological Economics and Department of Community Development and Applied Economics, University of Vermont, Burlington, Vermont, 05405, USA

<sup>c</sup> UVM Agricultural Extension Service, University of Vermont, Burlington, Vermont, 05405, USA

### ARTICLE INFO

#### Article history:

Received 9 February 2008

Received in revised form 31 January 2009

Accepted 11 March 2009

Available online 22 April 2009

#### Keywords:

Natural capital

Human capital

Ethiopia

Reforestation

Ecosystem services

Carbon

### ABSTRACT

Ethiopia remains underdeveloped due to limitations in natural, human, social and built capital. A 2006 scientific atelier conducted in the city of Awassa, Ethiopia investigated investments in human and natural capital as a sustainable development strategy. Local stakeholders identified firewood shortages, degradation of croplands, rising lake levels encroaching on croplands and poor water quality as major impediments to development. They further identified ecological degradation as a key component of these problems, and they acknowledged multiple vicious cycles compounding the environmental and economic threats to the Awassa community. Proposed solutions included investment in natural capital in the form of reforestation activities, investment in human capital in the form of promoting more efficient wood stoves along with increasing public awareness of environmental threats, and investments in social capital in the form of inter-institutional coordination to address environmental problems. All recommended investments rely primarily on national resources, in distinct contrast to the extensive imports required for most built capital investments. Unfortunately, Awassa lacks the surplus necessary for major capital investments of any kind. The atelier therefore helped local participants identify potential funders and write grant proposals for various projects, though none have been funded so far. Reversing the ecological degradation on the scale necessary for sustained economic development in Ethiopia however will require a steady flow of substantial investments, and cannot rely solely on the short term generosity of funders. International payments for carbon sequestration and other ecosystem services could help provide the necessary resources.

© 2009 Elsevier B.V. All rights reserved.

### 1. Introduction

With a per capita Gross Domestic Product (GDP) of under \$100 per year and ranking 170 out of 177 ranked countries on the United Nations Human Development Index (UNDP, 2004), Ethiopia is one of the least developed countries on the planet. Human life is impossible without adequate food, water and energy, yet Ethiopia consistently lacks secure supplies of these essential resources. Frequent drought and famine contribute to food insecurity, and almost 60% of the population—including 89% of the rural population—lacks access to potable drinking water (Hilton Foundation, 2006). Meanwhile the dominant source of energy is biomass, largely obtained from wood. However, forest resources in Ethiopia are dwindling so rapidly that charcoal, the favored cooking fuel, has recently been made illegal.

A key component of food, water, and energy shortages is the massive ecological degradation the country has suffered over many centuries—in particular the loss of forest cover. Population pressures, land-intensive agricultural practices, and economic distress—especially among poor farmers and pastoralists—have interacted to generate vicious cycles of land exploitation, ecological degradation, and poverty. In addition to these rapidly compounding disinvestments in natural capital, low human and social capital—as evidenced by high illiteracy (especially among women), high unemployment, and an unstable political situation—have further exacerbated negative feedback cycles. Lack of capital is the central limiting factor in the development of the country. However, the current development paradigm focuses almost exclusively on investments in built capital, funded by overseas investors, and largely ignores the importance of natural, human, and social capital in development efforts. And yet it may be the case that the latter forms of capital offer far more promise for policymakers and development practitioners seeking to break vicious cycles and promote virtuous ones in developing countries. This paper uses the results of a 2006 atelier to investigate the potential for investments in human and natural capital, as a

\* Corresponding author. Tel.: +1 802 363 3074; fax: +1 802 656 1423.

E-mail addresses: [twreynol@u.washington.edu](mailto:twreynol@u.washington.edu) (T.W. Reynolds),

[Joshua.Farley@uvm.edu](mailto:Joshua.Farley@uvm.edu) (J. Farley), [chuber@uvm.edu](mailto:chuber@uvm.edu) (C. Huber).

<sup>1</sup> Fax: +1 802 656 1423.

supplement to built capital investments, to promote sustainable development in the city of Awassa, Ethiopia.

## 2. Current development paradigm

Underdevelopment in Africa is generally attributed to a lack of industry, poor quality roads, and weak overall infrastructure. In Ethiopia all industries together, including food processing, beverages, textiles, leather, chemicals, and metals processing constitute less than 10% of total GDP. Agriculture is the main contributor to the Ethiopian economy; however, an underdeveloped infrastructure, including a lack of transportation and communication systems, seriously constrains agricultural markets (World Bank, 2006; Ehui and Pender, 2005). This lack of infrastructure also constrains outreach attempts by government and civil society aimed at educating Ethiopians in improved agricultural management practices, further retarding economic growth. Under the current dominant paradigm, overcoming underdevelopment in Ethiopia requires massive foreign investments in built capital for export-oriented growth: *foreign investment* because domestic capital supply is inadequate, and *export-oriented* because domestic consumption demand is inadequate. This neoclassical macroeconomic worldview has distinctly shaped Ethiopian and international development activities and outcomes.

And yet the record of overseas financial capital investment in Ethiopia is poor. Capitalists demand profit on their investments, and the rate of profit they seek is proportional to the degree of risk they perceive. Ethiopia is a high risk country, yet returns on investments are among the lowest in sub-Saharan Africa, which in large part explains the paucity of investments (Eifert et al., 2005). Ethiopia is currently encouraging foreign countries to invest in the mineral sector, which can yield large short term revenues necessary to attract foreign investment, most recently from countries including China and India (Jenkins and Edwards, 2006). However, mineral reserves are non-renewable capital stocks that, once exhausted, are gone forever. Moreover, mining is notorious for its negative and long-term environmental impacts (Boocock, 2002). Since foreign investors in Ethiopia are currently free to remit all profits, and capital gains taxes were recently slashed from 40% to 10% (Ethiopian Reporter, 2006), it is not at all clear that conventional financial investments will significantly or sustainably benefit the country.

The export-led model of development poses other problems as well. While comparative advantage theory claims that all countries will benefit from free trade, this is only true when factors of production such as financial capital cannot flow across international boundaries (Daly, 2002; Daly and Cobb, 1994). Ethiopians with financial capital to invest will look for an absolute advantage, investing their money wherever it generates the greatest risk-adjusted returns. Ethiopia's absolute advantage is in low wage labor, and most of the labor force is in agriculture (Ehui and Pender, 2005; MoFED, 2004). Higher wages would eliminate this advantage. Consequently, though increased agricultural exports may "look good" in terms of increased GDP, few benefits accrue to the small producers and agricultural workers who make up the vast majority of Ethiopia's population.

An additional weakness of agricultural export-led development schemes stems from the simple fact that farmers producing crops for export still have to eat. In Ethiopia in particular, with inadequate transportation systems to distribute imported food, domestic food security demands domestic production. Increasing total agricultural production typically requires increasing land under cultivation—and in Ethiopia, the only way to increase land under cultivation is to cut down more of the near-exhausted forest, or to engage in other undesirable practices such as removing lands from fallow or farming steep slopes. Studies in the Ivory Coast (Ehui et al., 1990)

and Thailand (Panayatou and Parasuk, 1990) suggest that beyond a certain point, the result of increasing land under cultivation can actually be a decline in net agricultural production. In Ethiopia, agricultural expansion has served to promote wind and water erosion as well as desertification, ultimately lowering the productivity of existing farmland while destroying what little forest remains (Bishaw, 2001).

An obvious alternative to expanding land under cultivation is increasing productivity on existing farm lands. Historically the approach to agricultural intensification in Ethiopia has been to invest in built capital: "modernizing" agriculture by introducing fertilizers, pesticides, farm machinery, and irrigation systems (Ehui and Pender, 2005). Unfortunately, such modernization is heavily reliant on imports as well as fossil fuels, which are required not only to make, maintain and power machinery, but also to produce fertilizers and pesticides. Ethiopia has few fossil fuel reserves of its own, and fossil fuel prices are increasing rapidly as new discoveries have lagged behind production (Heinberg, 2005; Campbell and Laherrère, 1998). If the price of agricultural commodity exports fails to keep up with that of fossil fuels, then conventional modernization threatens to become a losing investment. Add to this the inherent difficulties in competing in global markets for agricultural products due to wildly fluctuating commodity prices and trade subsidies in many countries, and it becomes clear that export-led development based on industrial agriculture is not a promising path for Ethiopia either.

## 3. An alternative paradigm: investing in human and natural capital

Ultimately, though the lack of built capital is important, it is clearly but one factor among many resulting in the underdevelopment of the country. In fact, upon reflection it is difficult to determine to what degree lagging built capital levels in Ethiopia are actually a "cause"—as opposed to an effect—of underdevelopment. A more holistic consideration of the range of contributors to Ethiopia's present situation, including natural and human capital factors, might reveal points of greater leverage for policymakers and development practitioners seeking to help push the country out of the present cycles of underdevelopment and poverty.

### 3.1. Natural capital disinvestments

First, like much of East Africa, Ethiopia is currently witnessing massive disinvestments in natural capital. High forest cover in Ethiopia fell from 16.0% in the 1950s to only 2.7% by the early 1990s, and continues to decline by nearly 1% per year as woodlands are converted to fuel wood, farmland and building materials (Shiferaw and Holden, 2001). The negative feedback loops generated and strengthened by this process are readily apparent. Deforestation in the steeply mountainous regions of the country leads to extensive erosion, with estimated soil losses of up to 41,000 tons/km<sup>2</sup>/year in some areas (Mahamed and Ram, 1987). The soil erosion problem in Ethiopia is particularly severe due to the erosive and bimodal nature of rainfall, and the fragility of the light volcanic soil (Berry 2003; Alemu 1999). Nationally, Ethiopia experiences total topsoil losses of over 1 billion tons/year (Brown, 2006), leading to the irreversible degradation of over 5 million acres of former cropland (Dregne, 1990), and to the widespread 'jest' that Ethiopia's most valuable export is its topsoil. Forest loss may also be triggering regional climate change, including a reduction in annual rainfall, while deforestation combined with overgrazing leads to soil compaction, exacerbating periods of violent flooding and widespread droughts. The net result is a dramatic decline in agricultural production (Bekele, 2001). This, in turn, provokes the further expansion of agricultural lands into ever more marginal lands, often including highly ecologically sensitive parcels—and important sources of ecosystem

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات