

Published in *Savings and Development*

Fall 2006

“Natural Savings”: A New Microsavings Product for Inflationary Environments
How to Save Forests with Savings for and by the Poor?

Marek Hudon

Harvard University

FNRS Research Fellow – Centre Emile Bernheim - Université Libre de Bruxelles (ULB)

mhudon@fas.harvard.edu

Bernard Lietaer

Center for Sustainable Resources

University of California at Berkeley

Abstract: Decentralized sustainable resource management in developing countries is important both from a poverty-reduction and an ecological viewpoint. At the same time, no financial instrument is available that enables small savings to be protected against the vagaries of monetary instabilities and inflation. This paper proposes a solution that would address all three issues simultaneously: an inflation-proof savings instrument, fully backed by the organic growth process of a local resource, which at the same time gives a market-based financial incentive to protect that natural resource. A specific example involving sustainable forestry plantations in the Third World is provided.

Keywords: savings, microfinance, natural resources, deforestation, inflation, sustainable development, poverty reduction.

JEL Codes: G21, G32, L22, L31, O16, P23, Q14

1. Background

This paper describes a new microfinance product called “Natural Savings”, a retail savings instrument fully-backed by a natural growth process, and useable as a local medium of exchange. The backing could be any commercially valuable product that grows organically over time, whose ownership can be secured, and which can be maintained and harvested without unduly high costs. Examples of such products include trees or any other commercial plant that grows organically in value over years, breeding fish in a protected lake, or wild game in an enclosed forest.

Its originality is:

- a retail savings product that protects against inflation and monetary instabilities;
- fully backed by a natural growth process;
- that can be used as an inflation-proof medium of exchange;
- and that realigns financial interest with ecologically sustainable practices.

If such a financial product were implemented on an appropriate scale, it could contribute to address three interrelated Third World development issues: poverty reduction, sustainable resource management, and savings at the grass-root level.

As a concrete example, the “natural growth process” involved could be the one of a tree plantation. But the principle could be adapted to any other products that naturally grow in value over time, and whose ownership can be legally protected.

Forests have recently been put in the spotlight of development policies, and more specifically of rural development (United Nations, 2002). For instance, it has been found that communities and individuals whose livelihoods are dependent on forest-based resources often lag behind the rest of the development process because of their geographic isolation and socio-economic marginalisation (Castren, 2005). The World Bank estimates that roughly 80 per cent of people living in absolute poverty depend on forests for part of their livelihood, a situation that clearly strengthens this correlation

between forest dependency and poverty (World Bank, 2002). More precisely, Scherr et al. (2004) estimates that approximately one to 1.5 billion poor live under forest dependency.

Policy-makers have understood that forests need to be integrated into local economies to maximize the benefits to the communities and local economies, and that management of these resources should be shared between forestry professionals and local users.

Furthermore, while previous community-based forest management used to be mostly subordinated to state control, local communities are nowadays increasingly involved in forest management systems (Pretty & Ward, 2001; Castren, 2005).

Deforestation is also a growing global ecological concern. Forests are a major sink for carbon emissions, with the result that deforestation is an important force behind global climate change by reducing that carbon sink. Furthermore, tropical forests cover only 6 per cent of the world's land surface, but they hold between fifty per cent and eighty per cent of the world's diversity in terrestrial species of plants and animals. On a local level, deforestation is well-known to contribute to landslides, erosion and sediment runoff into streams; as well as reduce rainfall and therefore contribute to desertification. As Rush (1991) argued, forest management is still inherently political since it revolves around control over resource. For instance, Gauld (2000) provides the example of the Philippines, where community-based forestry policy and design have resulted in the marginalisation of the social and environmental concerns. Furthermore, high rates of resource exploitation may be part of a welfare-maximizing programme. The rates currently observed in developing countries are exceedingly high, the resulting pattern of management of natural resources is therefore patently inefficient (Plateau & Baland, 1996).

Finally, only 12 per cent of the world's forests lie within protected areas, so that in a worse case scenario most of the readily accessible remaining forests outside these protected areas are at risk through unsustainable harvesting within decades (Diamond, 2005). Lack of funds, human resources, traditional domination by political and economic elites, and a weak rule of law are some of the forces that work against effective decentralized forest governance (Andersson, 2004).

Integrated conservation and development projects merging preservation of natural resources with local development in less-developed countries are increasingly favoured (Becker, 2003). However, many experts emphasize that natural forests may lack comparative advantages for poverty alleviation, because few projects have resulted in win-win outcomes between national forestry and national poverty alleviation (Wunder, 2001).

The third and last issue we will deal with is savings in developing countries. Savings represent the excess liquidities that the poor want to set aside for the proverbial rainy day. Small savings facilities are useful to help smooth the variable income streams inherent to many activities, for instance in agriculture where cash flow frequently depends on a few crops. In developing countries, where social safety nets are often unreliable or inexistent for the poor, savings can also be used as insurance substitutes (Morduch, 1999). While many experts had long thought that the poor simply do not have the desire or capacity to save, it turns out that the demand for secure and convenient saving services is often even stronger among the poor than are credit services (Wright, 1999; Armendariz and Morduch, 2004).

Deposit-taking represents both a service to clients and a source of funds for financial institutions. Not only do client savings provide an obvious 'cushion' for timely repayment of loans, they can be used as an alternative and relatively cheap source of funds for the microfinance institutions themselves, because the interest rates for deposits are invariably lower than those for loans (Robinson, 2000; Schmidt and Zeitinger, 1998).

International experiences also show that effective marketing attracts significant volumes of savings and that a much larger number of clients can be reached through savings mobilization than through credit-granting (Fiebig et al., 1999). Finally, savings are significant not only from the micro-economic perspective, but also from the macro-economic one as the overall process of development is clearly strengthened with a savings base.

Notwithstanding all these arguments, microsavings have long been the forgotten half of finance in developing countries, even where financial services reach the lowest levels of the economically active poor (Vogel, 1984). In contrast, other microfinance products have impressively developed to reach around seventy million clients today. Starting at the end of the seventies mainly with microcredits, they have now expanded to other financial instruments to alleviate poverty, such as microinsurance (Jalan and Ravallion, 1999; Morduch, forthcoming). But microsavings have long remained neglected even within the microfinance sector itself. For instance, the Grameen Bank in Bangladesh did not traditionally place much emphasis - beyond compulsory savings - on providing savings services to their members. This notwithstanding precedents of experiences of saving systems that can be found in West Africa, where itinerant deposits collectors collect savings from their customer and charge them a fee for this service (Udry, 1994) So why are there so few successful savings instruments for the poor in the developing world?

2. Impediments to Savings in Countries with High Inflation

One of the main characteristics of the economic environment of the poor in developing countries is that they have to live with unusually high levels of insecurity and risk. Three main reasons for this insecurity include: the fact that flows of income and expenditure often do not coincide; household-specific factors, such as sickness, theft, premature death; and collective environmental factors such natural disasters (e.g. flooding,

hurricanes, earthquakes), bank failures in the formal sector or national economic and monetary crises (Matin et al., 2002).

Evidence from Asia and Latin America shows that the major constraint for microsavings was product design, as such products need to be tailored specifically to the needs of the poor (Meyer, 2002; Hudon, 2004). The poor require local and affordable products that suit their capacity to save, and meet their needs for occasional lump sums for emergencies (Rutherford, 2000; p. 114).

However, savings in a national money has proven unsuccessful - for either poor or wealthy individuals - whenever the value of that money is systematically eroded by high inflation or monetary volatility. Particularly when the real return on financial savings is negative due to inflation, there is clearly not much of an incentive to forego current consumption.

In many developing countries, savings rates in national currency predictably decrease when high inflation rates prevail. Indeed, first evidence from a small sample of sixty developing countries¹ show that while there is a strong positive correlation between gross savings and gross domestic income, the correlation is negative between the average inflation rate (CPI or GDP deflator) and gross saving rate n(See Appendix 1). Even the poor save less in national currency when they face very high inflation rates.

As a consequence, in countries with high inflation, people who try to save tend to accumulate value in real assets rather than deposit their money in accounts where real purchasing power simply erodes over time; or they prefer to save in the form of foreign bills or other informal options (Elsler et al., 1999). Robinson (2000) has described the advantages and disadvantages for savers of such informal savings options. Savings in-kind or in valuables face tremendous security problems and get very limited returns. Rotating savings and credit associations (ROSCAs) are not so useful for members receiving funds late in a ROSCA cycle; and they remain vulnerable to all the weaknesses of the macroeconomic framework.

¹ These sixty countries are extracted from the World Bank database, with average of inflation rate and savings rate between 1991 and 2001.

In short, in countries where the monetary environment is not congenial, savings in general and microsavings in particular have proven of limited value. Therefore, there is a consensus that indispensable preconditions for a genuine development of microsavings include a minimum of monetary, economic and social stability (UNCDF, 1999). Even strong and trustworthy institutional arrangements will fail to mobilize savings in the absence of an favorable monetary environment (Fiebig et al., 1999).

A last impediment for microsavings institutions is found in the regulatory policies of most central banks. One of the roles of regulatory monetary authorities is to protect clients who entrust their savings to a financial institution. Consequently, as soon as microfinance institutions accept deposits from clients, central bankers tend to impose a tighter regulatory regime, such as minimum capital and capital adequacy (Christen and Rosenberg, 2000). Whenever access to national, international donor or private funds is limited because of macroeconomic instability, such requirements are often overwhelming.

Because of all the above hurdles, no savings product has yet been designed that can protect poor people in countries with high monetary uncertainties.

3. Proposal for a “Natural Savings” Instrument

The proposed savings tool has four objectives.

First, it would provide an inflation-proof and robust savings instrument for the rural working poor in the developing countries where the national money is subject to high inflation.

Second, it aims at reducing the wealth gap between the rich and poor people without relying on tax redistribution mechanisms, which often tend to be ineffective in developing countries anyway. Indeed, thanks to this system, long-term wealth would be created, earned and accumulated directly by the poor themselves.

Third, it would encourage sustainable resource management including reforestation and sustainable forestry in the developing world, with the positive environmental benefits that this entails.

Finally, this system would make available a local complementary currency that would marginally increase the liquidity available in the poorest communities.

A complementary currency can be defined as an agreement within a community to use something as a medium of exchange in parallel with national money. While there are now more than 4,000 grass-root complementary currency systems operational around the world (Lietaer 2001, 2004), none effectively addresses the issue of savings.

It is important to understand that this is a *complementary* currency, not one that would replace the conventional money or existing microfinance products, but would function in parallel with them on a local level.

Owning a natural resource that grows naturally over time like trees as a long term safe investment is clearly not a new idea - it has been done on an individual level for millennia. Even on an institutional basis today, major insurance companies own many large forest plantations in Europe or the US for exactly that purpose. What is new in this proposal is to make such investments available as a “retail product” for small scale, inflation-proof savings, and in a way that makes also available for occasional use as a standardized medium of exchange for local use.

The idea to provide market-based financial incentives to preserve forests is not a new idea either. It is indeed widely accepted that one of the main problems, if not the main problem, for sustainable forest management and conservation is that it is only rarely a viable financial proposition, while forest exploitation or deforestation continues to be a highly profitable activity. The policies recommended to introduce such financial incentives typically require involvement by the national government, such as fiscal support and transfer payments (Richards, 2000). In contrast, what will be proposed here provides a systematic financial incentive directly at the grass-root level, without the requirement of governmental interventions or payments.

The initiative for introducing a Natural Savings product would be supported by the hundreds of thousands of local groups focusing on forest preservation and sustainable

agriculture which have already sprung up in developing countries over the past decade (Pretty & Ward., 2001). As emphasized by Plateau and Baland (1996), “in many in many circumstances, co-ordination and leadership problems play a dominant role. In those cases, rural communities can effectively sustain co-operation even though users are numerous and do not interact frequently, provided that an effective authority structure exists to provide the required leadership and sufficient trust is established to countenance optimistic expectations regarding others' intended behaviour”.

A legal environment with a minimum of predictability, so that property rights for a small locally owned corporation can be legally protected. We understand that the lack of formal property rights can be a major problem in some countries, as it is even considered as a key source of poverty (de Soto, 2000). Based on international data, Deacon (1999) found that ownership security (not only forest ownership but overall property rights) lessens deforestation. Castren (2005) similarly confirmed that secure property rights can be directly linked to more sustainable forestry and less deforestation.

1. A community, preferably rural, that has some manpower available; and has access to the organizational capacity to implement a commercial forest plantation project;
2. A plot of land, suitable for a forest plantation, and for commercial harvest at maturity;
3. Access to the amount of initial capital necessary for the raw materials and infrastructure for a reforestation project (not including most of the labour costs);
4. A possibility to obtain insurance against major disasters for the plantation project (e.g. against fire or an outbreak of disease).

The process starts with the creation of a legal entity, which we will call here a “Natural Savings company”. It would either own or lease the plot of land described above, depending on the financial situation of the initiators of the project. This entity would ultimately become the owner of the timber to be planted. Let us assume that this company has 100,000 shares that would be backed by the trees planted on a specific lot. Part of the labor costs of the work for planting and maintaining the forest would be paid in those shares to the community members who are performing the work, the rest being paid in national money.

To avoid any dilution of the value of the shares of the earlier workers, the company would not be allowed to issue more shares without simultaneously creating also additional plantations to back such additional issues. The need for a robust governance structure of the savings company must be particularly stressed. Various legal frameworks could be used depending on the institution that introduces and manages the savings company (e.g. a commercial or a not-for-profit microfinance institution, a local agricultural society, a cooperative, etc.) In all cases, it would be important to ensure total transparency about the system and managerial decisions, further strengthened by periodic external audits and other safeguards against fraud.

The shares of the savings company could be issued in the form of a paper currency, or they could be administered in an electronic account run by an independent organization. New mobile phone technologies appropriate for such environments are currently being field tested in India for applications in microfinance administration, and could be adopted for this application as well (Parikh, 2005). Experiences with complementary currencies in developing countries have shown that even people from the poorest communities can handle shares or complementary currencies.

The next step involves creating a value profile over time for the “tree shares” – i.e. the shares of the savings company. If there are 100,000 shares in the development company, the value of one share represents simply 1/100,000 of the total value of the timber in the plantation.

In countries with high or unpredictable inflation rates, the value of the shares could be expressed in days of work as opposed to national money, as shown in Figure 1. Such a value curve would be based on the best data available on the growth of the specific species of trees over time in this climate, and their market value in either the national or international market, whichever market would be the one where the timber would be sold at maturity. What matters is that the members of the community can understand the value of a share in their own terms, to facilitate the exchange of the shares for goods and services among themselves. This information would be openly communicated to the

community. Let us assume that the kind of trees planted would be mature and ready for harvest after twenty years. Whatever the value curve is for the period between plantation and harvest, it should provide an easy reference for the number of shares that would be paid for a day's work.

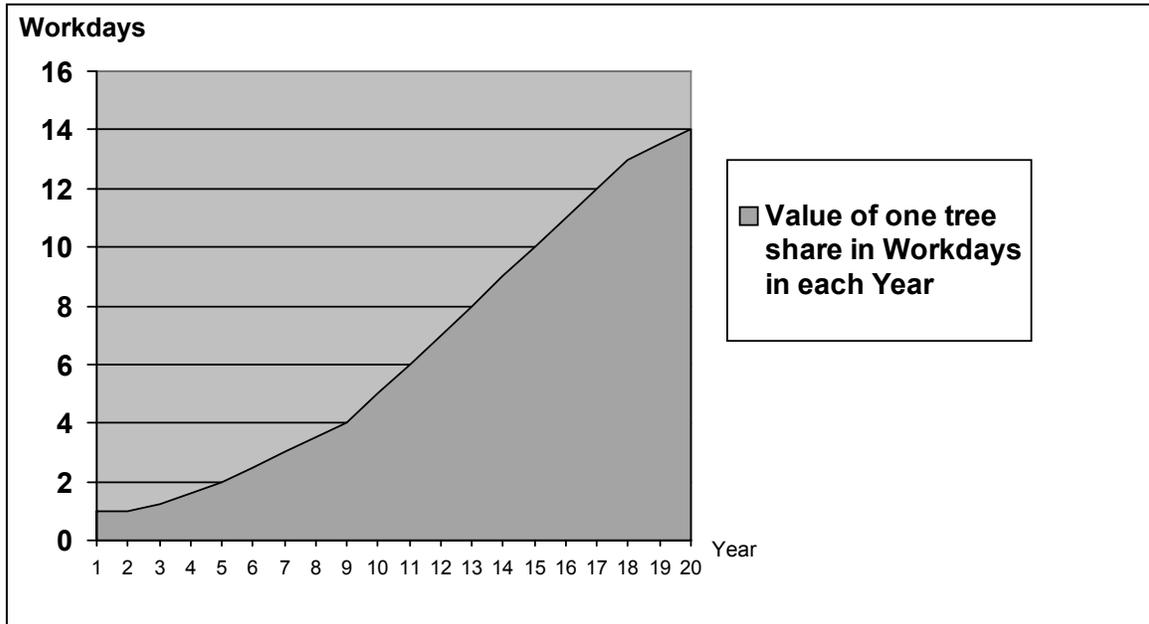


Figure 1: Example of the Value over Time of one Tree Share expressed in workdays. S

For example, let us assume that the value of a “tree share” at maturity after twenty years is fourteen workdays, and that its growth is reflected by the value curve of Figure 1. In this example, one day's work would give right to one share during the first two years of the project. But by the 9th year the shares have grown in value to four days of work, so a day's work would be payable with a quarter of a share. Of course, it would also be possible to pay labour only partially in tree shares, and the rest in national money.

Workers could also earn tree shares by doing work for the community in development projects other than the tree plantation itself. For instance, one could imagine that the labour provided by members of a community for infrastructure projects that would benefit that community (e.g. a local road, or an irrigation canal, etc) could also be financed by this means. Any such project would necessarily require coordination with the savings company because of the need to ensure that the total value of the plantation

project will be fair value for the total work provided and paid in the shares over time. The ideal would be that by the time of maturity of the forest, most if not all of the shares would be owned by members of the community.

At maturity, the forest is harvested and the timber sold for national money. All the shares earned by community members up to that point are redeemed with the proceeds of the sale of the timber. The value curve should be a conservative estimate of the value of the timber, as it is preferable to have a windfall profit rather than a shortage in terms of the expectations of the participants.

One could then start the whole process over with a new plantation on the same land, and a new issue of shares for the next generation of workers.²

What can a community member who has earned some tree shares of the Natural Savings company do with them?

First of all, he or she could simply keep them up to full maturity and then cash them in with the proceeds of the harvest. This approach would use the tree share as a pure savings instrument; a perfectly valid option for anybody who wants to accumulate some resources for retirement, their children's higher education, or some other long-term goal.

A second option is that he or she could trade those shares for whatever goods or services are available within the community. To the extent that this would happen, the tree share would function as a complementary currency, providing additional liquidity in that community. The value of the exchange should theoretically reflect the value of the tree currency at the time of the exchange, but the owner of the shares and the person who accepts them in an exchange can decide for themselves what is appropriate.

A third option, to be managed with more caution, is to have the savings company make available the possibility to "cash in" the shares before maturity, with payment in national money. This possibility may be useful to build up trust in the system. This option could

² Depending on the size of the land and the community, one could of course make this a continuous process, with new plantations and harvest on parts of the total forest on a periodic basis, on a rotating basis. Well known forestry management techniques should be applied as appropriate.

be important for example if immediate cash requirements occur (e.g. an accident, disease, a wedding, etc), to avoid that a sudden family situation obliges people to dump the shares far below their real value.

The value of such an early redemption could be the value at that moment in time as reflected in the value curve of Figure 1, minus for example a ten per cent transaction fee. Such a fee would encourage community members to engage in bilateral exchanges, rather than cashing them in with the Natural Savings company, so that the community member who accepts the shares in an exchange can use them in turn as savings.

If this third option is made available, one needs to ensure that the Natural Savings company has access to the necessary cash at the appropriate time, to avoid a ‘run on the savings company’ (the equivalent of a ‘run on the bank’ in a conventional monetary environment).

Finally, the risks born by the savers could be diversified *ex-ante* by launching different natural savings products, with different tree species, with different maturities, or even totally different natural savings processes (for instance, having a fish breeding project in a local lake, in parallel with a forestry project). Diversification could also be made available *ex-post* by facilitating exchanges of shares of one project for another in the same region, or by using whatever savings instruments are available in national money.

4. Some Theoretical Considerations

Most economic textbooks automatically assume that a currency has to play the three classical functions to be proper “money”: i.e. unit of account, medium of exchange and store of value. From a legal perspective, one often adds the role of “legal tender” as well. This assumption is in fact invalid both historically, and even operationally today.

Historically, many civilizations have used different instruments as unit of account and medium of exchange. For instance, Homer always refers to cattle as unit of account (“Diomedes’ armour was worth seven oxen”), while most payments were actually made

in a variety of other – more practical – media of exchange (e.g. metallic bars in bronze or silver, measured by weight).

The role of store of value was similarly often accomplished by an instrument other than the one used for exchanges (e.g. in Egypt silver bars were the main store of value, while a wheat standard currency was used as ordinary medium of exchange). One should note that in Modern history, the national currencies of even the most developed countries have proven very unreliable long-term stores of value. The Deutsche Mark- the currency that best kept its value since World War II - has eroded in real value from 100 in 1971 to 42.28 by 1996. One hundred US\$ dropped in purchasing power to 24.72 over the same time period, while the British Pound shrunk to 12.57. With Third World currencies, the drop in value is still much more dramatic.

The “tree currency” proposed here is explicitly designed to not play all three classical functions of money. Its main function is as a store of value, and a secondary one is an occasional medium of exchange. It is not to be expected that it will perform the role of unit of account, that it will circulate frequently as medium of exchange, and even less that it will ever become legal tender. In all these functions, the national money would continue to play its role as today.

Another consideration is the issue of the reduction of the gap between the rich and poor, which is one of the objectives of Natural Savings. The conventional way to try to address this gap has been to increase taxes on the rich to redistribute the proceeds in programs benefiting the poor. This method is often ineffective in developing countries where tax collection is spotty at best.

The interesting effect of the proposed mechanism in this respect is that it enables the poor willing to work to create and accumulate real wealth directly themselves. The best way and time of earning tree shares is by actively participating in the tree plantation project, or get involved in some other community project approved by the savings company. In this sense, this is a very effective way to achieve wealth accumulation at the poorest levels. An investment in living trees will not only be inflation-proof and secure against

monetary crashes; but it also grows organically and fairly predictably in value over time until maturity.

A further refinement to the system is possible whenever there exist incentive schemes for forest plantations (e.g. the Chilean forest incentive system), or transfer payments for new plantations as recommended by development experts (Richards, 2000); or any other means to obtain an income flow in conventional currency before the harvesting of the trees (e.g. carbon sequestration rights). These payments would go to the Natural Savings company, that could use them either as part of its conventional currency reserves for expenses (e.g. materials needed for projects) or for the part of the payment made to workers in national money. Another option is to use such proceeds for payment as dividends to the community members who are owners of the shares. Any such incentives would simply add to the attractiveness of a Natural Savings project.

Finally, this approach is sustainable, as it can be rotated and renewed at maturity with a new plantation and a new emission of shares, *ad infinitum*. This model is also scalable to almost any size. Furthermore, it is replicable in many countries, particularly those that face macroeconomic instability.

It would be preferable to have a number of small, locally owned savings companies, rather than one giant one that would perform this function for many communities, because local ownership would give a direct incentive for the local population to better protect their own local resources. Several smaller units also would develop over time the managerial and self-sufficiency skills of the communities themselves.

5. Complementarities with Microfinance Products

A Natural Savings product would be a useful addition to existing microfinance products. Their complementarity manifest in three dimensions: customers, product, and institutional.

Customer Complementarity

Natural Savings products would fill some important gaps in customers' reach for microfinance products, particularly in the direction of the poorest of poor.

One of the hottest debates currently on-going in the microfinance field – sometimes dubbed the “microfinance schism” - is about how microcredit can reach the lower socio-economic levels (Morduch, 2000). Referring to the 2.7 billion people living below the official poverty line of US\$2 per day as “the poor” doesn't give us enough distinctions for our purposes here. We propose to differentiate between four different categories, not so much in terms of various minimum dollar amounts, but in terms of the degree to which the people involved are or could become economically active. The four categories are:

- the *economically active*, people who are currently economically active and generate an income either above or below the official poverty line;
- the *temporarily inactive poor* are those people who have the necessary skills or history of being economically active, but are currently unemployed or significantly underemployed;
- the *potentially active poor* are indigent people who could theoretically be capable of becoming economically active, but in practice don't have the skills or the opportunities to do so;
- finally, the *permanently disabled* are those who are incapacitated mentally or physically to the point where an economic activity is unfortunately not realistic, so that charity will be enduringly necessary in their lifetime.

Many experts believe financially sustainable microcredit delivery cannot be achieved with the “poorest of the poor”. Indeed, microcredit products are often specifically designed for income-generating activities - and sometimes for income-smoothing for less poor clients.

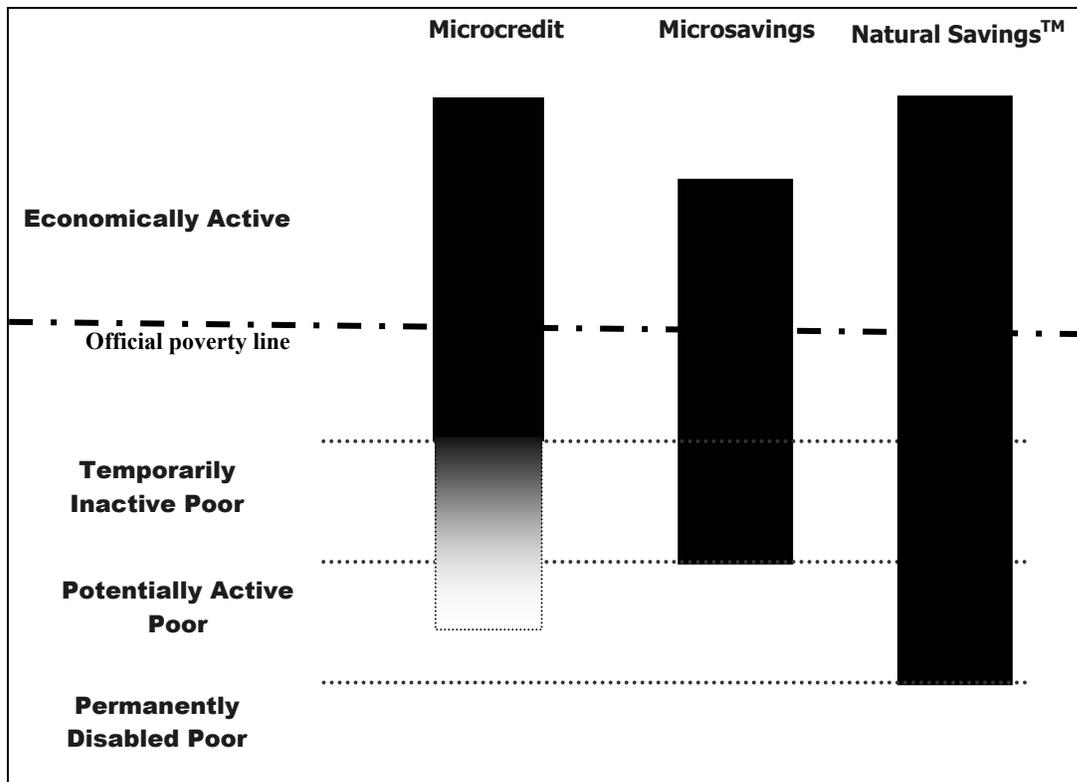


Figure 2: Microfinance products vs. Natural Savings from a customer perspective in a country with high or unpredictable inflation

Translated into our framework, this would mean that there is consensus that sustainable microcredit works best for the economically active, but that there is some debate about how many of the *temporarily inactive poor* could be included. Most experts allege that sustainable microcredit wouldn't be able to cover all of the *potentially active poor*. This limit to the outreach of financially sustainable microcredit is shown as the grey area in the microcredit column of Figure 2.

Microsavings reaches down to the *temporarily inactive poor*, because people who may not qualify for a loan, nevertheless may have some savings accumulated from previous work, inheritance or other sources. This is supported by international experiences that show that temporarily inactive poor can be reached more easily through savings mobilization than through credit-granting (Fiebig et al, 1999). But microsavings would

tend not to reach the upper strata of the economically active in a country with high inflation. The reason is that - from a straightforward financial point of view - whoever lives in a country with high inflation is motivated to have debts in national money and physical assets or savings in foreign money. This explains why, in the graph, some of the upper echelons of the economically active people, specifically those who are financially sophisticated, may be interested in microcredit, but not in microsavings.

In contrast, tree shares could be earned by anybody willing to do some work (i.e. all except permanently disabled people), and would be valuable savings assets for anybody. Even very poor clients, who can only be sporadically active could earn and benefit from this savings instrument. Furthermore, even at the upper end of the socio-economic scale, ownership of tree currency would be a valuable asset as it is actually safer and more robust than what is available even in foreign savings deposits. Such people may not want to work in plantations to earn the tree currency, but they could accept them in trades with those who have earned them directly. Therefore the Natural Savings currency would be appealing to an unusually wide range of clients, including the poorest of the poor.

Product Complementarity

From a product complementarity viewpoint, savings services delivered by today's microfinance institutions do not serve exactly the same objectives as Natural Savings. While most microsavings offered today in developing countries correspond to short or medium term financial products, Natural Savings would encourage longer term savings, even if they would be tradable before their maturity. Furthermore, they provide a guaranteed net return above the inflation rate. The terms of both types of products are therefore complementary.

Institutional Complementarity

The same institution could deliver microfinance products and manage Natural Savings products. Thanks to the use of a common delivery mechanism, economies of scale could be found for training, accounting, human resource management, etc. Microfinance

institutions have also gained an unusual practical knowledge of the field and of the local communities.

Moreover, through an extended analysis with data from Bangladesh, Godquin (2004) found that the provision of non-financial services, such as primary health, basic literacy, marketing information and occupational and skill training, has a positive impact on self-esteem which translates directly into a better repayment performance.

At this point, it is recognized that female clients often have better repayment rates (Hulme and Mosley, 1997), and return to investment seem to be better spread over all household member when credit is directed at women (Pitt and Kandker, 1998; Pitt et al., 1999). Similarly, while most microfinance clients are women, it has been observed that that microfinance programmes which build social capital can indeed make a significant contribution to women's empowerment (Mayoux, 2001). Participation in microfinance programme is able to increase women's welfare and possibly to reduce male bias in welfare outcomes, particularly in poor households (Mahmud, 2003). Furthermore, Holvoet (2005) finds that when financial products are combined with social and financial group intermediation, decision-making process shifts from male to joint and female decision making process. This further strengthens the empowerment effect of microfinance schemes. It is clear that households that have accumulated some Natural Savings would become better credit risks overall that would otherwise be the case, and that a joint project would strengthen the local community fabric.

Interestingly, the evidence that groups of people planting trees together bolsters social capital in indigenous populations already exists. This was demonstrated for instance by the Green Belt movement that has planted some thirty million trees in Kenya over the past thirty years. The leader of that movement, Wangari Maathai, was awarded the Nobel Peace Prize in January 2005 - the first African woman to be honoured by a Nobel Prize – precisely because of the beneficial build up of social capital produced by people working together to plant trees.

One key issue concerning the microfinance sector could also find a partial solution with the development of Natural Savings companies. In a sector increasingly dominated by

commercial players such as commercial banks, other types of microfinance institutions, such as social-purpose non-governmental organizations (NGOs), need to diversify their activities and products to reach sustainability. NGOs providing microfinance services to very poor borrowers face the most daunting hurdles to reach self-sufficiency, as they depend on a rapid increase of their clients' income to become financially sustainable themselves (Mosley and Hulme, 1998).

Furthermore, Dehejia et al. (2005) have shown that less wealthy clients are the most sensitive to the interest rate variations. MFI's portfolios would thus shift away from its poorest borrowers when interest rates are increased. Linkages with Natural Savings companies would offer them opportunities for new products and technical assistance which makes it easier for them to avoid having to increase the interest. Such microfinance institutions could even use the savings company as their own financial repository.

All microfinance institutions would ultimately benefit from the improved creditworthiness of their clients. For the commercial microfinance institutions, the existence of a robust savings tool would also help ensuring that more microfinance clients can build some reliable collateral. This would clearly broaden their client base over time. Another plus: from a regulatory viewpoint, Natural Savings companies would fall under a country's corporate legislation as opposed to central bank regulation, as they are not taking any national money deposits from clients. Corporate legislation requires lower capital requirements than banking regulation, which is one of the impediments we identified for microfinance institutions to get involved in microsavings. In counterpart, requiring tight and public audits of the Natural Savings companies would be important to protect their small shareholders. Fraud would undermine the credibility of such institutions.

This complementarity between microfinance institutions and Natural Savings companies would justify that some microfinance institutions may be interested in taking the initiative in creating such a company themselves, because they benefit from a unique comparative advantage thanks to their knowledge of the field and their capacity to manage small amounts of money. The financing requirements in conventional money to set up such a

system would be limited to the legal costs for incorporating a company, the raw materials for the initial plantations, the insurances against fires and disasters that should protect the plantation and the component of labour costs that would be payable in national money. The land itself could be leased as stated earlier and the lease paid in whole or part with Natural Savings shares, so the use of the land wouldn't necessarily have to be a national money expense.

Finally, it is clear that payments in Natural Savings shares will not replace payments in conventional currency. Gresham's law ("bad money displaces good") would apply. People would tend to hoard the tree currency. For ordinary exchanges people would prefer to continue to use national money (in this case "bad money" in Gresham's terminology in comparison with the tree currency, because of its inflationary tendencies). Such hoarding of Natural Savings currency would be fine in this case, as it is actually the primary purpose of this product

6. Limits to Applicability

We do not claim that this product is a panacea for the complex issues of resource management, poverty reduction or microfinance institutional sustainability. Indeed there are some unavoidable limitations for the applicability of the Natural Savings approach. A first set of limitations has already been mentioned in the list of pre-conditions to the launch of this product, the most critical of which is a legal environment that provides ownership security. There are at least three other limits that should be mentioned at this point.

The first limitation is an ecological one. Not all regions have an appropriate resource available. In the specific case of our tree example, for instance, not all soils are appropriate for forest plantations. Caution should be exerted particularly in areas where water scarcity is an issue.

Another concern is that - if the approach were to become very popular and only a narrow range of tree species were to be selected for this purpose - it would affect the long-term

world price of these species, and therefore potentially reduce their benefits as a long-term savings tool. This is a feature of almost any financial product: too much popularity tends to reduce opportunity. One precaution, if this approach were to be applied on a large scale, would be to encourage diversity in bioregions and natural resource species involved.

A third constraint is that there exists some physical maximum to the quantity of natural resources that can be used as backing for Natural Savings. This maximum cannot be determined with precision, but some indirect indications are available. For our example of trees, the FAO estimates global trade in forest products at US\$ 140 billion per year, a quarter of which involves tropical timber trade (Adams & Castaño, 2000). But this gives only a very rough indication of what we are looking for. Indeed, global trade numbers do not include demand of these products in domestic markets within the producing countries themselves. Furthermore, values would be significantly affected by the choice of species that would be planted, and the degree of local processing the product would receive before being exported. Finally, trade numbers give an indication of timber produced during one year's harvest. Using the twenty year horizon of our tree example above, the potential backing for savings should be at least an order of magnitude larger than yearly sales.

On the down side, Natural Savings products should be expected to capture only a fraction of the global market. For the tree example, if these plantations could be operated in a sustainable way, they can obtain certification by the Forest Stewardship Council (FSC)³. The FSC takes into account local social benefits, so timber production for Natural Savings projects would obtain a plus that might be helpful in capturing a more significant share of the FSC certified forests market.

However, we should recognize that in any case there exists some theoretical physical upper limit to the volume of Natural Savings products that could be issued, even if that limit is high enough not to constitute a constraint for the foreseeable future.

³ See www.fsc.org.

7. Conclusions

Few savings products have proven to be effective in an inflationary and unstable monetary environment. Microfinance has provided part of the answer by designing credit, insurance or savings products for the poor population; but even in those cases, monetary instability remains a major impediment particularly for the savings products. To solve this challenging problem, we have proposed a new savings product that would be independent from the national money fluctuations.

Thanks to this new product, the poor could obtain a robust long-term savings instrument, complementary to short or medium-term microsavings and easily manageable. It would enable to reach very poor clients and directly improve their capital formation process.

Furthermore, this product would favour sustainable development processes, and become part of a solution to the resource management issues, including the deforestation problem affecting many developing countries. If the Natural Savings companies are linked to the expertise and management provided by existing local actors, such as NGOs, microfinance institutions and local sustainable forest and agricultural groups, this could produce an even stronger leveraging effect. The ultimate result would be to enable the financial sector to achieve a faster and deeper inclusion of the poorest communities.

This new tool could also become a way to help in long-term disaster reconstruction, for example to fund the reforestation and reconstruction effort after the devastating disasters such as the tsunami of December 2004. Finally, while the primary application described in this paper is for Third World countries that are inflation or crisis prone, further research could also be useful to design small scale savings in developed countries as well. After all, currency instability and unsustainable resource practices are unfortunately not limited to developing countries.

APPENDIX

Correlation matrix of Macro-economic Data for 60 Developing Countries (World Bank Data Base)

	Inflation, GDP deflator (annual %)--	Inflation, consumer prices (annual %)--	Gross domestic income (LCU)--	Gross domestic savings (LCU)--
Inflation, GDP deflator (annual %)	1	0.525	-0.179	-0.161
Inflation, consumer prices (annual %)		1	-0.195	-0.192
Gross domestic income (LCU)			1	0.968
Gross domestic savings (LCU)				1

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