

# **First Kilometer Incentives**

## **A Review of the Literature**

**by**  
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### **Introduction**

The purpose of this document is to review the literature concerning the incentives that are used to bridge the “First Kilometer.” The term “Last Mile” is often used to indicate the gap between the rural farmers and all of the agricultural support staff who are attempting to deliver agricultural content and skills to them. As WorldAgInfo is focused on incorporating the rural farmer into the creation and delivery of their own content, the term “First Kilometer” is used to indicate this same gap, but approached from the other direction.

Through this review, several themes emerged. In general, these themes can be described as demonstrating incentives that are economic, that deal with extension or other educational services, those efforts that attempt to build the farmers’ voice in the process, those efforts that attempt to build trust in the system, and those efforts that deal with technical or infrastructural needs. This document will describe each of these themes in turn.

Before exploring the specific issues, it is important to note that it is understood that the larger-scale economic policies adopted within a region or country can also have a huge impact on the circumstances of the rural farmers. For example, the economic and land-usage policies adopted over the past decade within Zimbabwe have had incalculable impacts on the economic well-being of everyone involved – not just smallholder farmers. However, as the focus of this paper is on the smaller-scale incentives that can be delivered to help the day-to-day lives of the farmers. Larger-scale policy issues will not be covered in-depth here.

## **Economic**

### *Microfinance*

Microfinance has demonstrated good potential in non-agricultural sectors of the economies of developing countries. This mechanism, however, has not been as quickly adopted in the agricultural sector. According to the Foundation for world Agriculture and Rural Life (2007), “the response of microfinance institutions to agricultural demand is generally either insufficient or inappropriate. Family farms in the South face different constraints than do small entrepreneurs; their economic cycle is long, risk is elevated, profit margins are volatile, and financial service needs are concentrated in certain periods of the year, as is cash for repayment” (¶ 1). In an effort to address this need, the Foundation for world Agriculture and Rural Life will hold a conference in December, 2007 to examine the potential microfinance holds for farming and what policy initiatives are needed to assure success.

The International Fund for Agricultural Development (IFAD) explored the “apparent failings in microfinance for farmers, the lack of attention to lending to the poorest, the issue of crop insurance and the issue of interest rates” (IFAD, 2004). In targeting the poorest segment of rural populations of Bangladesh, the IFAD developed the Microfinance and Technical Support Project, which “focuses on mitigating poor people's vulnerability, improving their access to essential services and resources, and supporting their livelihoods, particularly through livestock” (IFAD, 2007).

### *Credit*

Outside of microfinance the other credit opportunities for smallholders have most often been limited and exploitive. As an example, Hampel-Milagrosa (2007) found that Philippino farmers had difficulty accessing credit through legitimate channels, and thus approached wholesalers for their credit needs. According to Hampel-Milagrosa, this had

the effect of limiting trading alternatives for farmers as they became tied to their creditors.

### *Impacts of Indebtedness*

The expansion of credit systems – in some cases at the expense of the farmer – has had an impact on the livelihoods of those farmers. There is a body of literature that alludes to a connection between growing indebtedness and suicides. Although being careful to not draw causal inferences, Mohanakumar and Sharma (2006), Rao and Suri (2006), Satish (2006), Srijit (2006), and Jeromi (2007) all discuss the growing rate of debt in India in relation to rates of farmer suicides. In fact, Mohanakumar and Sharma go so far to say “unless the plight of farmers is addressed in terms of changing the macro-policies regulating taxes, prices and imports, the condition of the farmers cannot be improved on a sustainable basis” (p. 1553). Rao and Suri (2006) point out that “what forces farmers to take their lives is not the amount of debt per se, but the changed nature of agriculture involving high costs and low or negative returns” (p. 1546).

Due to the problems created by credit and subsequent indebtedness, the Indian government created the National Agricultural Insurance Scheme (NAIS). Described by Vyas & Surjit (2006), the NAIS “is vital for providing insurance cover to farmers, across regions, across seasons and across crops in India” (p. 4585). Many issues remain. As an example, Vyas & Surjit explore whether crop insurance should be compulsory or voluntary, an issue that is complicated by the huge cost of the subsidized program and the subsequent difficulty with sustainability.

### *Other Initiatives*

Kabra (2007) explored the potential of a commodity futures market in India. Although this market has grown dramatically in a relatively short time, Kabra demonstrates that it is primarily benefiting speculators and has done little for smallholder farmers. Various types of economic assistance are tied to issues of health. Hope (2003)

discusses the potential of barter systems in providing free access to health services. In this collaborative effort, the community cooperates to support the health clinic through agricultural means in order to assure that all members have access to health coverage. Zhang, Wang, Wang, and Hsiao (2006) described a Chinese health initiative, through which farmers would be enticed to participate in community-based health insurance through subsidy assistance.

### **Extension/Education**

Several case studies illustrate the strengths and weaknesses of extension and other educational initiatives. For example, Moussa, van Houten, and Mwangore (2006) studied an extension service in Benin that included observers who were supported as part of a project administered by the Farming System Diversification and Improvement Project (PADSE). These observers were responsible for visiting farms, assessing concerns and advising farmers on strategies for confronting those concerns – particularly the use of Lutte Etagee Ciblee (LEC) technology to control *helicoverpa armigera* in cotton cultivation. Moussa, van Houten, and Mwangore's results illustrate some of the difficulties with extension services, particularly those that are funded as part of projects. Although the researchers state that the “approach transformed pest management knowledge” (p. 208), their results supported the concept that “farmers got accustomed to receiving free-of-charge agricultural extension services and thought therefore that the project would continue to finance the services of village observers” (p. 208). The end results was that farmers, who were supposed to self-fund the extension services after the project had ended, eventually abandoned the technology when the project's funding ended. Further, it noted that the technology diffusion was often limited to the close friends of the village observers, which is another weakness of some extension services.

Vaarst, Byarugaba, Nakavuma, and Laker (2007), investigated the idea of “common learning” where groups of individuals met with extension agents and university scientists for several hours of instruction every two weeks for a year. The researchers found that the structure of this type of content provision created “mutual trust, openness

and respect,” (p. 1) improved their farm production, and allowed them to become information resources for the rest of their community.

Most telling, perhaps, is the work of Kristiansen, Taji, and Reganold (2006), which states that “development should start from the existing (agricultural) practices, yield levels, knowledge and attitude and not from the promises, potentials or perspectives of a new, to be introduced, technology” (p. 351). Particularly important is the emphasis on extension models that are no longer “top-down” but are rather developed through a participatory process. This focus on a switch from strictly top-down models of development and extension to a process that involves all stakeholders is echoed throughout the literature. A good example of this type of development process is presented by Ceccarelli and Grando (2007), who describe a plant-breeding process involving breeders, farmers, and extension specialists in the decision making process. This allowed everyone involved a voice in making certain that the best crops were matched with the appropriate environmental conditions and that the best plant breeds were selected for future cycles of development.

## **Voice**

This focus on bottom-up participation in the development raises the important point of allowing all people involved in the process to have a voice in the outcome of that process. This is, in fact, a core value for many developmental processes. For example, Jepson, Kakoli, and Kenmore (2006), when discussing guidelines for GMO post-release monitoring programs, stated that there must be “a serious commitment to engage and consult with people with a stake in the final outcome throughout the process” (p. 13). The work of Vaarst, Byarugaba, Nakavuma, and Laker (2007), discussed earlier, illustrates the empowerment that can be seen when everyone has a voice in the process. In this work, the local farmers began to feel like information experts and information resources for the rest of their community based on participation with extension agents and university scientists.

In fact, Rishi and Guili (2005), in a study of forest management systems state that inputs from locals are of the utmost importance in ensuring success. By building trust with the local population, staff members of the forest department were able to change attitudes, perceptions and redefined their relationship with the villagers. The success of such initiatives depends, to a great extent, on the quality of leadership involved and the populations' willingness to accept participatory leadership principles.

Participatory communication is not always easy. For example, Tam (2006) argues that "communication of environmental knowledge is deeply embedded in social power structures" and that this has "direct implications for participatory resource planning and implementation" (p. 1). In essence, the social structure of the village (in this case villages in Southeast Sulawesi, Indonesia) can make it extremely difficult to involve all stakeholders in the collaborative decision making process. Tam ascribes this to "silent conflict" that is found within cultures that emphasize harmony and respect for authority.

The results for farmers who do not have a voice in the larger agricultural process can be extreme and detrimental. Reflecting on the works of Mohanakumar and Sharma (2006), Satish (2006), Srijit (2006), and Jeromi (2007) concerning the impact of indebtedness, Rao and Suri (2006) state that changes to the political structures and systems have had the effect of removing rural farmers from policy decisions. The subsequent loss of a voice in the process impacts their levels of distress and leads to a higher likelihood of suicide.

### *Gender*

Fujimoto and Yagi (2005) report that affirmative action programs in Japan that aim at helping women to become farm managers and to alter the perceptions of gender have had success in improving women's voice within rural communities. This is echoed by Nitya (2005), who states that giving women control over land and resources in an effort towards gender equality can be an effective means to reduce poverty in rural areas.

## **Trust/Cooperation**

Trust and cooperation are also major incentives for rural farmers in developing countries. According to Batt, et al. (2006), good relationships between agricultural buyers and sellers are determined by the trust level between the participants. In this research, it was found that the willingness to provide advice was one of the key elements to creating trusting relationships. As can be seen in the literature concerning voice, when individuals are involved with the process they have more trust in it. For example, Masuku, Kristen, and Owen (2007), in a study of the relationship between sugar cane farmers and millers in South Africa, “found that satisfaction by cane growers on [sic] their relationship with millers has a positive relationship with their level of trust, level of commitment, relative dependence, perception of opportunistic behaviour by millers and perceived cooperation between themselves and the millers” (p. 94). When the growers sensed behavior that the authors defined as “opportunistic” then this trust was damaged, which in turn negatively impacted their willingness to cooperate with the millers.

These results are echoed throughout the literature. Darroch and Mushayanyama (2006), doing research on the 48 members of the Exemvelo Farmers’ Organization in South Africa, also found that “empirical recursive models show that a high level of satisfaction in the working relationship results in these farmers trusting the pack-house agent more. High levels of trust, in turn, lead to higher levels of both commitment to, and cooperation in, the supply chain” (p. 339). Going further, Darroch and Mushayanyama state that one means of improving satisfaction and trust between the farmers and the pack-house agents would involve “co-investment” of resources and greater cooperation in the planning of crop products.

In the literature concerning the issue of trust, many studies focus on the “social capital” that is built through trusting relationships. According to Cramb (2006), social capital “refers to the relationships of trust, communication, and cooperation that facilitate collective action in a community” (p. 23). This emphasis on collective effort and action is important, according to Cramb, as it offers the opportunity to effectively raise awareness

of issues – in his case soil degradation and effective soil conservation training practices. Moazami (2006) adds a further element to Cramb’s definition when she says that social capital “is defined as social relationships characterized by trust and solidarity, which offer individuals a flow of benefits” (p. 67). The concept of individualization of benefits that arise through social capital, when added to Cramb’s concept of collective action, would seem to indicate that there are benefits for the individual as well as the village when social capital is leveraged and maximized.

The benefits of social capital are further explored by Diwakara (2006), who states that cooperation and trust in the process play central roles in the development of social capital, which is also seen as “critical for good governance and economic development” (p. 163). Further, Diwakara found that difference in personal attributes – particularly social-economic and demographic – impact the development of trusting and cooperative relationships. Work by Bastelaer and Leathers (2006) supports this, by showing that trust and social capital are strongly associated with repayment of debt. They state “attitudes and values shared by community members create an environment in which seed borrowers honour their engagements” (p. 1788).

The key element to using trust as a motivator and incentive for the smallholders would appear to be designing structures that foster strong communication between the participants. For example, Fred-Mensah (2005) returns to the idea of social capital, which he believes is based on the idea of *nugormesese*, or “a culture of mutual understanding and trust” (§ 3). According to Fred-Mensah, *nugormesese* serves as the foundation for social capital because it can “hold members of a group together by effectively setting and facilitating the terms of their relationships” (§ 1). Another important element of this process of trust building involves farmers viewing good practices by other people they already trust. For example, Omolehin (2007) discusses how important this is in the success of manure contracts as a soil management strategy in Nigeria.

It’s important to point out, however, the negative aspects of trust relationships. Just as open and honest relationships foster trust, dishonest and confrontational

relationships are prone to negative outcomes. For example, Akanda and Isoda (2006) discuss the impact that expanded telephone service, both landlines and cell phones, have had on price information systems in Bangladesh. In this case, in addition to several positive outcomes, they also saw an increase in collusion within the trader population, which served to benefit the traders at the expense of the farmers. This, of course, is to be expected when working within a profit-based system. For example Milagrosa and Slangen (2006), in research concerning decision making of rural farmers in the Philippines, described three models of decision-making based on who was leading the process. In their work, commissioner- and wholesaler-led governance structures were strongly motivated by profit. The only governance structure with trust as a central component was where contractors led the process.

## **Technical/Infrastructure**

### *Technology*

Another very important incentive for improving the lives of smallholder farmers, the provision of either technical assistance or infrastructure, is discussed to a lesser extent throughout the literature. There are several different forms this type of assistance can take. For example, Sukhadeo and Fan (2007) describe how “public investments in research and development, infrastructure (such as roads, power, irrigation, communication and education) and anti-poverty programmes” (p. 704) are main elements of poverty reduction programs in India and China, which have also increased agricultural production, rural non-farmer wages and rural farmer wages. They are, however, careful to explain that different interventions have different returns for the investment.

Greater use of computerization for maintaining land records, was studied by Manoj and Singh (2006). According to Manoj and Singh, computerized records had several direct benefits for farmers. Among these are the immediate availability and currency of the records, the transparency of the system and the fact that it is more difficult to manipulate the system. Again, just as with Sukhadeo and Fan (2007), Manoj

and Singh also point out that technology has limitations as well, such as difficulties created by uncertain power situations and limited access to computer technology in some cases.

The expanded use of the cell phone is receiving increased attention in research studies. Focused more on the use of mobile phones by traders, Overa (2006) states that this technology has assisted the traders in their efforts to reduce agricultural transportation and transactional costs. Overa also states that this technology, by its very nature as a communication tool, has enhanced trust in the networks, created better services, and higher profits. Which, if true, has great potential for improving the lives of smallholder farmers based on the research into voice and trust discussed earlier.

### *Infrastructural*

In addition to technical solutions, there is also, to a lesser extent, discussion in the literature of the impact that changes to the infrastructure can have on agricultural practices. For example, Sucharita and Saraswati (2006) discuss what types of infrastructural changes are necessary in order to make it possible for smallholder farmers to participate effectively in high-profit flower growing activities. In this instance, Sucharita and Saraswati state that any effort at crop diversification will be difficult unless “resource-related and institutional barriers like access to markets are overcome” (p. 2725).

Another infrastructural issue is the availability of water. Malavika (2006) illustrates the complexity of the water-usage issue when describing farmer protests of water policy in India. In this instance, the government was providing chemically-treated drinking water for the Keoladeo National Park, which was negatively impacting agricultural water availability. Water policy is, of course, a well known problem throughout the world. Effective water policy has powerful impacts on the quality of smallholder farmers’ lives.

## **Smallholder Overview**

Among the most important issues explored throughout this review of the literature is the significance of providing the smallholders a voice in the larger agricultural process and system. As important as this is, in and of itself, it is equally important for the impact it has on the trust-building it may engender. Focusing attention on the methods through which communications can be improved holds significant potential to make large differences in the lives of smallholder farmers. This also has a powerful impact on the extension services offered, because as communications improve the smallholders will have a stronger voice in the process, which will also impact the trust that the smallholders have in the system.

The discussion of financial options for assisting smallholder farmers is important. Through appropriate and effective use of microfinancing, other forms of credit, and other economic initiatives, it may be possible to avoid the cycle of indebtedness that has led to suicide concerns in rural agricultural settings. This would also include the financial implications for the technical and infrastructural initiatives that are used as incentives to improve agricultural livelihoods.

## **Where Do We Go From Here**

The literature documents successful initiatives that can be used as incentives for the smallholder farmer, however, greater specificity would be necessary before the transportability and scalability of any particular activities can be understood.

Water and soil management, crop diversification, leveraging of technology, fostering of farmers' voices, and economic assistance (to name just a few) are well known to be key issues in agricultural success. The complexity of the system makes it difficult to propose scalable, sustainable solutions to these problems. Examining specific programs that have been offered to incentivize farmers provides perspective to assist the development of strategies for promising next steps.

## Must Read Articles

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