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**FARMERS AND FARMERS' ASSOCIATIONS IN DEVELOPING COUNTRIES
AND THEIR USE OF MODERN FINANCIAL INSTRUMENTS**

Study prepared by the UNCTAD secretariat

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INTRODUCTION

1. Since the beginning of the 1990s, with the liberalization of commodity trading and pricing in developing countries and countries with economies in transition, the burden of risks has been shifted from Governments to farmers. In most of these countries, farmers, previously largely insulated from the day-to-day vagaries of the world market, now bear most of the brunt of volatile and unpredictable prices. In addition, they have often lost access to their earlier sources of subsidized and commercial formal-sector credit. Admittedly, the former state monopolies were often grossly inefficient, subsidized agricultural credit schemes only reached a minority of (generally, larger) farmers, and government price stabilization often was only a way of taxing the agricultural sector, but liberalization has nevertheless left farmers in an environment with considerable gaps in support structures.

2. When farmers receive prices that are unstable and uncertain, they run price risks from the moment that they decide to plant a crop, and every time that they buy and apply inputs such as fertilizers or pesticides, or use paid labour. They never know for sure whether the price that they receive at the end will cover their costs and be worth their efforts. Farmers' associations too may run price risks: if they advance their members credits which are to be reimbursed through future deliveries of crops, they run the risk that, at the moment that the crop is sold, prices have fallen to levels too low to enable loan reimbursement. Risk management markets, where risks can be transferred by those who cannot afford to shoulder them to those who are interested in taking on price risks,¹ can help farmers to get more certainty about their future, at least as far as the prices that they will receive are concerned. These markets are not a panacea for farmers' problems - they do not exist and are never likely to exist for all commodities, and can give only temporary reprieve from a secular fall of prices. Nevertheless, enabling access to these markets could greatly help developing country farmers to improve their lives, particularly as the vast majority of them can now cope with these price risks only by avoiding "risky" investment decisions, relying on their meager savings and adjusting their consumption – at the best, inefficient solutions, and often locking them in a vicious cycle of poverty.²

3. For many commodities, markets for the exchange of risks exist. However, except for a privileged few, developing country farmers have no access to these markets. At first sight, these markets would seem very far away from farmers. Nevertheless, the world's futures markets are where the prices of many commodities are determined. World maize and wheat prices are determined in Chicago, arabica coffee prices in New York, robusta coffee prices in London, cocoa prices in both of these cities together, palm

¹ The use of these markets to counterbalance the effects of unfavourable price movements on one's anticipated income, in other words to transfer unwanted risk, is called hedging. This is the opposite of speculation – for a commodity producer or buyer, speculation consists of doing nothing to hedge one's price risk.

² These traditional risk management strategies are a historical result of situations where farmers have no access to alternative strategies, and "traditional systems might persist well after they are the best means for addressing problems. (...) In these cases, risk-mitigating mechanisms that are part of a household's own poverty alleviation strategy can turn out to be part of the problem.(...) There is a role for policy in fostering movement towards situations where poor households use more flexible mechanisms to address risk." (J.J. Morduch, "Issues on risk and poverty", mimeo, Stiglitz Summer Research Workshop on Poverty, The World Bank, Washington D.C., July 6-July 8, 1999). There are also some indications that increased exposure of households to macro-economic risks makes traditional risk management tools, such as savings, ineffective – for example, from a study on Zimbabwe: "The prolonged period of drought and macroeconomic changes of the early 1990s has limited households' long-term ability to mitigate risk. Household risk management strategies are unable to successfully address covariant risks such as drought and economy wide structural changes." (Lire Ersado, Jeffrey Alwang and Harold Alderman, *Changes in Consumption and Saving Behavior before and after Economic Shocks: Evidence from Zimbabwe*, IAMA 2000 Agribusiness Forum, Chicago, USA).

oil prices in Kuala Lumpur, and so on for many other commodities. The function of these exchanges is not only to provide price discovery, but also to provide the facilities to manage price risk.³

4. The transfer of price risk is not the only facility that financial mechanisms and techniques can offer to farmers. Financial techniques can also be used to reduce farmers' counterparty risk. In many developing countries, past efforts to enhance farmers' access to credit through administrative means (special rural credit institutions, credit allocations, instructions to banks to lend part of their credit portfolio to agriculture) have been discontinued or have fallen in disarray. Without such administrative guidance, banks in developing countries are generally averse to providing credit to farmers. Legal systems in many countries make it difficult to use land or real estate as collateral for agricultural loans, and even where this is possible, a bank may have difficulty enforcing its rights in case of default (e.g., homestead provisions in many countries' laws make it impossible for a bank to take possession of a farmer's principal home). Financial engineering techniques can help by shifting the risk of lending from the farmer (a credit risk: will the farmer pay?) to the crop (a performance risk: will the crop be produced?).

5. The trends in world commodity industry and market structures, what these imply for farmers in terms of greater risk exposure and reduced access to credit, and recommendations on how to deal with the resulting problems have been discussed in several earlier UNCTAD papers.⁴ This paper concentrates on practical applications of "new" financial techniques for enabling farmers to manage price risk and facilitating their access to credit.⁵ The first chapter gives an overview of farmers' attitude towards risk, and the possible roles of farmers' associations in helping farmers cope with price risk and in facilitating agricultural financing. The second chapter describes various applications of financial techniques for price risk management and agricultural finance. The third chapter focuses on possibilities for farmers and farmers' associations to enhance their use of these techniques, including through the use of modern communication and information technologies.

³ In principle, the prices of a commodity on a futures exchange and its prices in physical trade run more or less in parallel, so farmers can take a position on the exchange that offsets the price risk they take in their physical business. If one buys protection against price declines on the exchange, for example, and physical market prices decline, the loss on physical sales will be compensated by the financial profit on the futures or options bought on the exchange.

⁴ See, in particular, *National institution building to facilitate access to risk management markets for small producers and traders particularly from developing countries and countries in transition: Issues involved and possible ways to overcome them*, TD/B/CN.1/GE.1/2, 1994; *An integrated approach to the management of production and marketing risks in the primary sector of the developing countries*, UNCTAD/COM/8, 1997; and *Examination of the effectiveness and usefulness for commodity-dependent countries of the new tools in commodity markets: risk management and collateralized finance*, TD/B/COM.1/EM.5/2, 1999.

⁵ These techniques are "new" in the sense that in the developing world, they are used relatively little and in only a few countries. Commodity price risk management markets have been in existence in the USA for over 150 years (and in a few developing countries, for over a century), while one particular agricultural financing technique (warehouse receipt finance) was very important in the development of US agro-industry in the first half of the 20th century. However, the vast majority of developing country farmers have never had access to price risk management markets. As concerns warehouse receipt finance, this became less relevant with the institutionalization of US farming. With better record-keeping, it became much easier for banks to evaluate individual farmers' credit risks, and the need for financing techniques which avoid credit risk consequently disappeared – and with it, much of the relevant skills in the banking community.

Chapter I

THE IMPORTANCE OF RISK FOR FARMERS, AND THE POTENTIAL ROLES OF FARMERS' ASSOCIATIONS IN RISK INTERMEDIATION

6. During the 1990s, agricultural markets in most countries, and in particular in the developing world, went through a process of liberalization. Although the exact reasons were different from country to country, a number of factors often played a role: the realization that traditional pricing policies discouraged agricultural production; the deterioration of public financing, making it necessary to restructure or abolish expensive interventionist organizations; and pressure from donor organizations to liberalize agricultural policies.

7. The way that the liberalization process has been managed has not always been in the best interest of farmers. It is true that the, at best, paternalistic policies of the past often had rather negative effects on the agricultural sector, while the subsidies given to inputs and credits in no way compensated for the large amounts of money extracted by government marketing agencies. But nowadays, while farmers have often benefited by receiving a larger part of the final price of their products, at the same time they are no longer protected against volatile world market conditions and have often lost the only type of formal sector credit to which they had access. This forces farmers to look for new ways to manage price risk⁶ and for new ways to obtain affordable credit.

8. Liberalization is not the only factor which has caused a change in the way that agricultural marketing is organized. The key developments (demographic changes, technological progress, changing domestic and international market structures, and the changing nature of consumer demand) affecting commodity markets were extensively discussed in an UNCTAD report published in 1999.⁷ That report also discussed the implications of these developments for the process of commodity price formation and the benefits that developing countries can draw from their commodity sectors. One of the conclusions is that farmers, if they wish to avoid becoming marginalized, need to organize themselves in such a way that they are able to take a proactive role in marketing – which requires them to get access to relevant market information and to efficient marketing and financing tools. Market-based price risk management tools and collateralized finance are among such tools.

9. This chapter gives a brief description of the relation between risk and farmers' behaviour, and then discusses the potential roles of farmers' associations in helping farmers mitigate risks through use of market-based instruments and in improving farmers' risk profile in order to obtain easier access to credit.

A. Farmers' risk exposure and attitude towards price risk

10. Agricultural production is subject to various risks. The main ones are production or yield risk caused by uncontrollable events related to weather, diseases, etc.; institutional risk resulting from changes in policies and regulations that affect agriculture; human or personal risks (accidents etc.); and financial

⁶ When Governments operate minimum price programmes or give price subsidies, farmers are naturally less inclined to manage price risks. For example, in a 1997 survey in Minnesota, USA, about 47% of the surveyed farmers indicated that the government support programmes that prevailed until 1996 replaced their need for futures and options hedging strategies, and about 72% indicated that direct and indirect use of futures and option markets would become necessary with diminishing government support. (Darin K. Hanson and Glenn Pederson, "Price Risk Management by Minnesota Farmers", *Agricultural Economist*, No. 691, Winter 1998)

⁷ *The impact of changing supply-and-demand market structures on commodity prices and exports of major interest to developing countries*, TD/B/COM.1/EM.10/2, 1999.

risks associated with fluctuations in prices of inputs (including credit) and outputs.⁸ Most of the time, planting decisions have to be made without knowing the price of the final product the producers can get at the time of harvest. Individual farmers must deal with price fluctuations to make ends meet. Uncertainty about future incomes makes it difficult for farmers to make commitments with respect to future payment obligations (eg. debt repayment, investments in land, machines, equipment and school fees for children).

11. But whereas the risks that farmers face are clear, their behaviour towards risk exposure is still under discussion. Research gives the following indications:⁹

- Within the group of farmers and even within each sub-group, there are significant differences in the degree of risk aversion. While many farmers are willing to give up part of their income to reduce their risk exposure, a significant proportion is not.

- Farmers' concerns about risks have two aspects: concerns about the unpredictability and variability of income that are the result of risks; and concerns about downside risk. These two "types" of risks are perceived and handled differently.¹⁰

- Developing country farmers, who have little choice about their career, are likely to be more risk averse than developed country farmers.

- Smaller, poorer farmers are more risk-averse than larger, richer ones.¹¹

- Even risk-averse farmers make deliberate decisions that expose them to risks, in search of higher earnings.

- Imperfect access to risk management markets has a cost for farmers.¹²

- Price risk is generally mentioned by farmers as the major or one of the major risks to which they are exposed, and generally as more important than yield risk. This is the case even in the United States of America (where the Government provides a significant safety net for farmers and intervenes in markets to keep prices above world market levels).¹³

12. Given the wide range of risks to which farmers are exposed, managing just price risks is an imperfect solution – a combination of price risk and crop risk management or even income risk management gives better protection. However, except in a few countries, tools for managing crop risks

⁸ See Joy Harwood, Richard Heifner, Keith Coble, Janet Perry and Agapi Somwaru, *Managing Risk in Farming: Concepts, Research and Analysis*, Economic Research Service, United States Department of Agriculture, Washington DC, March 1999. For a systematic description of risks in the commodity chain, see UNCTAD, *An integrated approach to the management of production and marketing risks in the primary sector of the developing countries*, UNCTAD/COM/8, 1997

⁹ See Karen Brooks, "How do Risk and Uncertainty Affect Adoption of Technology by Small Farmers", Paper presented at the XXIV Congress of International Association of Agricultural Economists, Berlin, August 2000; William G. Tomek and Hikaru Hanawa Peterson, "Risk Management in Agricultural Markets: A Survey", Conference on Producer Marketing and Risk Management: Frontiers for the 21st Century, Orlando, January 2000; Kevin McNew and Wesley Musser, "Evidence of Farmer Forward Pricing Behaviour", Department of Agricultural and Resource Economics, University of Maryland, Working Paper No. 00-02, February 2000; Saurabh Sinha and Michael Lipton, "Damaging fluctuations, risk and poverty: a review", background paper for the World Development Report 2000/2001, The World Bank, October 1999.

¹⁰ J.B. Hardaker, R.B.M. Huirne and J.R. Anderson, *Coping with Risk in Agriculture*, CAB International, Wallingford, UK, 1997.

¹¹ "For resource-poor farmers, ... planning and management might generally be characterized as prudent, circumspect and cautious", *Planning and managing farm systems under uncertainty*, FAO, <http://www.fao.org/docrep/w7365e/w7365e0e.htm>

¹² "In economic theory, there are market solutions enabling agents to neutralize risks. (.) In reality, such contingency markets are not always available and they have a cost. In their absence or incompleteness, uncertainties affect producers' decisions (...) and lead them to produce below the profit maximising level of output." (OECD, *Approaches to income risk management in OECD countries*, May 2000).

¹³ See, for example, J. Harwood et al., *op.cit.*, 1999, and Keith H. Coble et al., *Crop Producer Risk Management Survey*, Mississippi State University, Information Report 99-001, September 1999.

are largely absent, and even if they are available, tend to provide a means to protect against catastrophe risks (major falls in a farmer's production, with the farmer carrying a large part of the downside risk himself before the crop insurance starts paying out) rather than a day-to-day risk management tool. And although the market in developed countries is evolving fast, tools for income risk management for farmers are even rarer. On the other hand, for a large number of crops, price risk management tools are readily available to those with the required skills and capital. Even if just managing price risks is not ideal, it is at least possible in today's world.

13. Research on the actual use of price risk management markets done in the United States generally finds that such use is below the optimal level.¹⁴ Nevertheless, use is significant: e.g., in a recent survey in four states (covering producers of cotton, maize, soybeans and wheat), it was found that 30 to 44 % of farmers (depending on the commodity) made direct use of futures and options, and, except in the case of cotton, 79 to 87 % made indirect use of futures and options markets (through the pricing clauses in their sales contracts – for cotton, the figure was 38%).¹⁵ Significantly, large farmers made more use of these markets than small ones. Large US farmers are much more dependent on their crop than small farmers, who generally have other sources of income.

14. There is much literature on the benefits of price risk management for large corporates – for these firms, managing risk is not a “zero-sum” game, but rather improves their net worth. There is much less literature on the benefits of price risk management for farmers' wealth. What would be the impact of enabling farmers to lay off part of their risks through the use of market-based instruments? It has been suggested that, irrespective of whether farmers are risk-averse or not, they may have an “optimal risk level”. As expressed by one US writer: “Consider tractor accidents. Twenty years ago farmers often died or suffered serious injury when pinned beneath wayward tractors. After examining the problem, engineers found a straightforward solution—a steel-reinforced bar over the driver's seat would prevent the tractor from crushing the driver. A few years after mandated roll bars on tractors were in place, the death rate and rate of serious injury remained roughly the same. People with roll bar-equipped tractors were driving harder, faster, and on steeper slopes, resulting in the same rate of fatal accidents as before the engineered response. Analogously, farmers with subsidized risk management will push harder and faster and take on more risk.”¹⁶ More likely, farmers optimize a combination of risks and rewards.¹⁷ Ultimately, however, even if farmers were to have such a “risk optimum”, this would not reduce the validity of promoting access to risk management markets – if such promotion does not reduce individual farmers' risk exposure, at least it helps them to improve their expected incomes.

¹⁴ A considerable amount of research is devoted to determining optimal hedging rules. See, for example, V. Gaspar, C. Gatete and J. Vercaemmen, J. "Optimal hedging under alternative capital structures and risk aversion: Comment", *Canadian Journal of Agricultural Economics* 40(4), 1992; and H. Lapan and G. Moschini "Futures hedging under price, bias, and production risk", *American Journal of Agricultural Economics* 76(3), 1994. “Much of this research suggests that farmers should forward price a relatively high proportion of their crop (usually over 70 percent). However, surveys show significantly less hedging among farmers.” Kevin McNew and Wesley Musser, “Evidence of Farmer Forward Pricing Behavior”, Working Paper No. 00-02, University of Maryland, February 2000.

¹⁵ Keith H. Coble et al., *op.cit.*, 1999. Significantly, this is in an environment where 50 to 60 % of the farmers (depending on the state) say they feel they are not sufficiently well-informed about futures and options.

¹⁶ Jerry Skees, “Agricultural Risk Management or Income Enhancement”, *Regulation*, Vol. 22 No. 1, <http://www.cato.org/pubs/regulation/regv22n1/agrisk.pdf>

¹⁷ See, for example, National Grain and Feed Foundation, *Optimal Grain Marketing: Balancing Risks and Revenue*, 1999.

B. Farmers' associations as risk management and finance intermediaries

14. If, as has been argued above, farmers could improve their welfare when given access to price risk management markets, then the question arises as to how they can obtain access to these markets. Individually, they are generally too small (making it not worthwhile for them to learn about the markets, and not profitable for brokers on risk management markets to work with them). Their risk management needs therefore need to be accumulated by an "intermediary". There are several possible "intermediation mechanisms" – the major ones are farmers' associations, banks, local commodity exchanges, processors, traders. This paper is focused on the potential role of farmers' associations.

15. Over the past decade, farmers' associations in developing countries (and countries with economies in transition) have largely changed from being extensions of government power to representative organizations.¹⁸ In developing countries, the pressure for change in the structure of farmers' organizations generally came from the grassroots level – in many cases through protests against corrupt and mismanaged government-led cooperatives, in others because farmers noticed that the only way they could procure inputs or market their products in an effective manner,¹⁹ after the abolition of government marketing organizations, was through self-organization.

16. Efficient associations – and these are still in a minority – could use price risk management and facilitate members' access to finance. At the international level, apex organizations are exploring this possibility keenly.²⁰ Risk management markets and structured finance markets offer few remedies for the many weak, poorly managed or even corrupt farmers' associations that still abound. But taking into account the fact that in many countries farmers have only been given the chance to organize themselves since, at best, the mid-1980s, and given the continuing efforts of international organizations to support the strengthening of farmers' associations, it can be expected that the number of strong, well-managed associations will grow rapidly. The risk management and financing functions described in this report will thus continue becoming more relevant.

17. Do farmers' associations have a role to play in managing price risks on behalf of their members? In effect, they must play a key role. Even if a government agency or a bank offers price insurance instruments, it will be difficult for the individual upcountry farmer to make use of this.

18. One may ask whether farmers' associations should provide this type of services to their members – why not rely on traders? If traders are highly competitive, it would be feasible for farmers' associations to concentrate on facilitation – explaining the instruments and their use to their members. But in many countries, competition is still far from perfect. One may even argue that risk management services are a natural part of a farmers' association's functions. In the United States of America, the country where farmers have the longest experience in exposure to price risks, most farmers' associations consider this as

¹⁸ Broadly defined as organizations that meet the following criteria:

- the organization acts as a focal point for the expression of farmers' needs and wishes;
- from small to large farmers, all members can express themselves freely;
- all members have the right to vote;
- farmers themselves control the organization, with credible powers vis-à-vis public and private counterparts.

See International Federation of Agricultural Producers, *Farmers' strategy for agricultural development and world food security*, www.ifap.org/farmer-strategy.htm.

¹⁹ See Fernand Vincent, "Manual of Practical Management for Third World Rural Development Associations", *Intermediate Technology Publications*, Vol. 2, 1997.

²⁰ For example, both the International Federation of Agricultural Producers and the International Cooperative Alliance are active members of the International Task Force on Commodity Risk Management in Developing Countries, convened in 1998 by James Wolfensohn, President of the World Bank, to examine new approaches to providing market-based price risk management to the poor.

part of their role. Indeed, a United States court found in 1992 that the directors of a relatively small grain farmers' cooperative had a duty to understand hedging (price risk management) techniques and had, in the early 1980s, "breached their duties by retaining a manager inexperienced in hedging (...) and failing to attain knowledge of the basic fundamentals of hedging to be able to direct the hedging activities and supervise the manager properly".²¹

19. Undertaking risk management activities could thus become a fairly normal responsibility for a farmers' association. In many African countries, many farmers' associations already undertake some risk management or risk sharing activities, such as the operation of communal cereal stocks or communal saving activities. They just have not been managing commodity price risks, which, of course, until recently were mainly borne by the Governments and thus were not very relevant for them. Further institutional development and specific training activities, as well as a positive approach by Governments, would appear to be the preconditions for bringing about a growth of the role of farmers' associations in risk management.

²¹ Brane v. Roth, Court of Appeals of Indiana, First District, 20 April 1992, North Eastern Reporter, 2nd Series.

Box I**Farmers' associations – their roots and forms**

What are farmers' associations? The simplest definition includes all types of associations constituted uniquely or in part by farmers, or having farmers as their sole or main members. The importance of this type of organization has been recognized for a long time. For example, in a 1975 World Bank report it was stated that "Group arrangements such as cooperatives provide an organized basis for handling many of the problems of providing access to services for large numbers of rural people. They allow a measure of involvement through participation, but also provide a vehicle for collective negotiation of credit, input supplies and delivery of marketable surpluses. Even land management can be organized on a cooperative basis. (...) The establishment of effective group organizations, such as farmers' associations and cooperatives, should have high priority."¹

In principle, cooperatives are not-for-profit ventures, existing simply to provide a service to farmers. For example, if few traders are active, they can make the markets for inputs or for products more competitive. By pooling products, they can negotiate better sales conditions than individual farmers, and even sell forward. By pooling products, they can procure machinery (for production or for primary/secondary processing) which is too expensive for individual farmers. They can invest in skills and systems, for example recruiting a professional trader or installing an Internet connection.

Farmers' associations can take various forms. All farmers in a region can, by decree, be members of an association, or the association can be formed on a voluntary basis. Use of the association for input procurement or product sales can be obligatory for its members, or it can provide just one of the alternatives. They can be specialized (e.g. a savings group created with the specific purpose of obtaining credits from formal institutions) or generic (e.g. a village association created to represent the local farmers in all kinds of different areas, from social to economic).

If a farmers' association is to be effective, the freedom to join or to quit is essential – farmers should feel the association belongs to them, rather than being imposed by the Government or a foreign aid donor. A second essential condition is that the association is truly democratic, with all members having the same rights, and collectively electing their representatives.² In the past, the record of farmers' associations has been very bad, precisely because these conditions were not met.

It should be underlined that farmers do not create an association in order to receive subsidies or other advantages. In other words, as is shown in several studies,³ the Government can promote the creation of truly representative farmers' associations without subsidizing them. Subsidies, in effect, often have negative effects: they weaken group dynamism and cohesion, and can create a free rider problem.

¹. The World Bank, *Rural Development*, Washington 1975

². Either with one farmer-one vote, or with votes according to the relative contributions of each farmer – the latter may seem to give unfair weight to larger farmers, but is generally more effective.

³. Natural Resources Institute, *Liberalization of cereals marketing in Sub-Saharan Africa: Implementation issues*, Marketing series No. 1, 1991.

Chapter II

RISK MANAGEMENT AND WAREHOUSE RECEIPT FINANCE: APPLICATIONS AND EXAMPLES OF USE

A. Price risk management instruments

20. Market-based price risk management instruments can be used by farmers to provide protection against worsening prices for a limited period of time.²² In the long run, the overall volatility of the prices one receives is not reduced, nor is farmers' average income with price risk management different in any significant manner from their average income without price risk management. But the predictability of the prices to be received vastly improves, enabling better decision-making and better access to and use of resources. This chapter does not discuss risk management behaviour such as high savings in period of high prices (a strategy that tends to be virtually impossible for poorer farmers), nor does it discuss diversification (in principle the more structural solution to volatile prices for a certain commodity, but in practice often a second-best solution into which farmers are forced by the absence of access to risk management markets) or group schemes such as cereal banks.²³ First, pricing clauses in physical marketing contracts are discussed, then stand-alone price risk management instruments; this is followed by a short description of possibilities to link expenditures and earnings.

A.1 Physical contracts

21. Through the contractual arrangements that they make for the sale and delivery of their products, farmers can shift certain risks to buyers. Contracts can give buyers a measure of control over the production process (in which case the contracts are called production contracts) or only give farmers security and/or flexibility in the determination of their sales prices (marketing contracts).²⁴

A.1.1 Production contracts

22. Contract farming is gaining ground in developed as well as developing countries. Firms often enter into production contracts with farmers to ensure timeliness of delivery and quality of agricultural products, and to gain control over the methods used in the farming process. The debate on its merits is still open.²⁵ Among the advantages of contracting are the capabilities that asset-poor farmers get to achieve economies of scale, superior technical advice, and the reduction of price risk, perhaps over a multi-year period. On the other hand, once the farmer has committed to a contractual arrangement with

²² Farmers can, of course, also use these instruments merely to get greater control over and more flexibility in their marketing and pricing decisions, rather than to reduce risk.

²³ Cereal banks are village or inter-village organizations for buying, storing and selling cereals, managed by a committee appointed by the village community and destined to guarantee the food security of this village community – and incidentally, prevent poorer farmers, who tend to sell grains directly after the harvest but fall into a food deficit a few months later, from losing out because of the often high price differential between these two seasons. Cereal banks buy grains at harvest time, store them in village storerooms, and sell them during the year. The record of cereal banks is mixed. In Burkina Faso, where the first large-scale initiative started in the mid-1970s, most have failed; in neighbouring Mali, the record has been better. Internal problems caused most of the defaults of cereal banks: poor management, abuse by a small group of farm leaders, absence of financial safeguards, and lack of commitment from villagers.

²⁴ See also J. Harwood et.al., *op.cit.*, 1999.

²⁵ See Nigel Key and David Runsten, "Contract Farming, Smallholders, and Rural Development in Latin America: The organization of agroprocessing firms and the scale of outgrower production" *World Development* Vol. 27 (1999), for a summary analysis of the debate.

an agricultural processor, especially when investment by the farmer in specialized capital is involved, the farmer is liable to be exploited through monopsony power of the buyer.

23. There are three main types of production contracts: production management contracts, resource-providing contracts, and outgrower schemes. Production management contracts are mostly used for the sale of vegetables. Under these contracts, the buyer determines planting schedules and seed varieties, and guarantees the purchase of the products (if they meet certain criteria) at a certain price. When crops fail, however, or do not meet quality standards, the farmer receives no payment.

24. Resource-providing contracts are often used when specialized inputs and management are required to ensure that the final crop meets the buyers' standards. Payments to farmers often consist of two components: (a) a base payment (a fixed amount), and (b) incentive payments based upon a farmer's performance relative to other farmers. Under this type of agreement, a farmer generally provides land, utilities and labour and covers operating expenses; he acts as a custodian of the production operation. Price risks and a large part of production risks are shifted to the buyers.

25. Outgrower schemes are much used in developing countries for crops such as bananas, palm oil, rubber and sugar, with a central processing facility surrounded by farmers who produce, on their own land, under contract. The processor generally provides inputs and technical assistance to growers, and guarantees the purchase of their crop (if it meets standards). Farmers generally receive a pre-agreed percentage of the final sales price of their product and are thus fully exposed to price risk.

26. Contract farming is not discussed further in this paper. However, it can be noted that if one considers contract farming a positive development, then it may make sense for a (governmental) agency to promote the use of call options to provide farmers with the possibility of benefiting from improved prices once they have committed to a fixed physical sales price. These options give farmers the same risk profile as not having committed physical supplies and buying put options.²⁶

A.1.2 Marketing contracts

27. Marketing contracts can be verbal or written agreements between a buyer and a producer in which a price for delivering a commodity is set (or its relationship to a certain reference price is fixed) before harvest or before the commodity is ready to be marketed. Management decisions regarding the production remain with the farmer. Marketing contracts take many forms. The main ones in which farmers transfer price risk to some extent are described below.

28. *Fixed-price forward contracts.* In a fixed-price forward contract, the farmer commits himself to delivering at an agreed time a certain quantity of commodities of a specified quality. The price that he will then receive is already determined in the contract. Normally, the farmer is only paid on delivery, although this type of contract can be used as a tool to obtain pre-harvest financing. In varieties of this contract, farmers can commit themselves to delivering everything to be produced in their fields at a certain price (not uncommon in contract farming arrangements) or (rather uncommon these days) to delivering all their production from a certain field for a given amount (that is, the buyer takes the quantity risk).²⁷

²⁶ For this reason, Mexico's ASERCA (further discussed in section C. below) has included the provision of call options in its operations.

²⁷ In developing countries, marketing boards and export associations used to sell crops such as cocoa, coffee and sugar through forward contracts – for example, in the early 1990s, much of the world's cocoa exports were sold 12 to 18 months before the crop arrived. With liberalization, these forward sales have largely disappeared: private traders start forward selling only a few weeks before actual production.

29. *Minimum-price forward contracts.* This form of forward contract is similar to a fixed-price forward contract, except that the farmer is assured of receiving a certain price even when market conditions deteriorate. When the market price (expressed by a certain publicly quoted reference price, generally the price of a futures contract) increases, he receives a higher price. The trader protects himself from the price risk inherent in this type of contract by buying call options. From the farmer's side, this eliminates an important risk factor; and the incentive to default on the contract is less than is the case for fixed-price contracts. Nevertheless, there is a cost (the option premiums), which, particularly in the case of highly volatile markets or longer-term contracts, can be high.

30. *Reference-price forward contracts.* This form of forward contract uses reference prices, at times futures prices, but more often average export prices of a country. For their deliveries, farmers are paid automatically the price of the day, or period, when they make their delivery. This type of arrangement is quite common in contract farming and outgrower/nucleus estate systems. It is also the basis for the standard pricing formula for most developing country sugar producers, who receive a fixed percentage of the sales prices of their sugar.²⁸ They protect the margin of the collecting agent/processor, and they ensure that farmers get a fixed percentage of the export price, they do not provide any price risk protection. However, if the institutional mechanisms existed (e.g. if local banks or brokers were to offer the relevant services), the explicit link of the final sales price to a reference futures market price would allow producers to put into place an effective risk management programme.

31. *Price-to-be-fixed contracts.* As with the previous form of forward contract, reference prices are used, most commonly futures market prices. However in this case, the seller (or the buyer, in case of processors, importers or end-users) has the active ability to fix the prices at the moment he deems most opportune. Price-to-be-fixed (PTBF) contracts, also called "executable orders" (in sugar trade) or "on call" contracts (in cotton trade) are the most common form of export contract for commodities from Latin America, and are also very common in Asia; although still common, they are relatively less used in Africa. At times, this pricing formula reaches down to the level of the contracts between local buyers or processors and exporters, but (apart from the Latin America cereals, soybeans and sugar sectors) they are rarely used in contracts between farmers and local buyers/processors - farmers are most often only directly affected if their exports are arranged through a producers' cooperative or marketing association (e.g. the Brazilian sugar cooperative, or the sugar association of Mauritius).

32. There are many varieties to this form of contract. In general terms, PTBF contracts allow easy indirect access to futures markets. Entering into a PTBF contract means, for a producer, that he gets direct exposure to futures market prices. Indeed, the trader with whom he signs this contract will often hedge his price risks by selling a commensurate number of contracts on the futures exchange (although he may also hedge the price risks in his books, through back-to-back transactions). The producer does not need to pay margin deposits, nor is he exposed to the risk of margin calls: all these are the problem of the trader. Also, as the trader is fully hedged and therefore does not lose anything if the producer fixes prices at the best possible moment, this type of contract ensures a cooperative atmosphere between the two parties, giving the producer easy access to price information.

²⁸ Despite liberalization of sugar trade in many countries over the past decade, the sugar industry still remains one of the most regulated commodity industries, and hence pricing formulae for farmers are often rather complex. This is true for developed as well as developing country farmers. For example, French sugarbeet farmers receive, for their "C quota" sugar (produced outside of the price supports of the EU's sugar regime, and thus sold at world market prices), a price that is a combination of average futures prices during the export season and, under certain conditions, anticipatory price-fixing before the C sugar is manufactured (the French beet growers' federation indicates at what minimum prices farmers would be willing to lock in forward sales, and sugar factories have the liberty to decide whether or not to lock in these prices through hedging, and if so for what quantities).

33. *Hedge-to-arrive contracts.* Hedge-to-arrive contracts, also called no-basis-established contracts, are mostly used by farmers in the United States. Upon signing of the contract, the farmer indicates a futures price on which the final price will be based, but the basis is left open. The farmer can fix the basis (which is defined as the difference between a futures price and a publicly posted price) at a later stage, at any time before delivery. In the contractual arrangements as they have evolved in North America, farmers can roll over their contracts to new futures reference months (and accordingly postpone their physical delivery). This type of contract enables farmers to lock in favourable futures price levels at times when the basis is unfavourable. However, the risks for the provider of these instruments can be very difficult to manage; many US cooperatives lost major sums of money in the late 1990s when they were unable to maintain the margin requirements of exchanges, necessary to continue covering these contractual arrangements with producers.²⁹

34. *Customized min-max contracts.* In these contracts, a farmer agrees to deliver a specific quantity and quality of a commodity for delivery at a guaranteed minimum price, with the possibility of receiving a higher price up to a certain level – this is determined in relation to a reference price, generally a publicly posted price.

35. In practice, the vast majority of farmers in developing countries have no access to forward contracts that contain this kind of price risk management component. For example, a recent study of coffee marketing in several coffee-producing countries³⁰ found that, except in Guatemala, very few growers were able to sell coffee forward, and if they could, it was often at very high implied rates of interest (because buyers discount the price they offer to take into account performance risk). The main exceptions are countries in which government minimum prices are still effectively applied (but then farmers often pay for this through the low prices they receive) and where farmers have gone into contract farming arrangements.

A.2 Futures and options

36. Futures and options contracts are extensively discussed in literature, including various UNCTAD papers, and will therefore be introduced only summarily in this paper.³¹ A futures contract is a type of forward contract with highly standardized and closely specified contract terms.³² A futures contract specifies the exchange of a certain good at a future date for the predetermined price set at the initial time of contracting. Futures contracts are generally traded on commodity exchanges such as the Chicago Board of Trade, the Bombay Oilseeds & Oils Exchange, or one of the new Internet exchanges. Buyers and sellers generally access the exchanges through futures brokers, although the Internet exchanges are facilitating direct access.

37. Options are risk management instruments that do not lock in prices but give protection against unfavourable price movements, with the possibility of profiting from favourable ones. They trade on exchanges as well as on the over-the-counter market (that is, they are offered by banks, traders and others). For farmers, the most relevant options are put options, which are comparable to insurance

²⁹ On how to manage the risks of this and other types of complex physical trade contracts, see National Grain and Feed Foundation, *Hybrid Cash Grain Contracts - Assessing, Managing and Controlling Risk*, 1996.

³⁰ Panos Varangis and Robert Simmons, *Study of Marketing and Trading policies and systems in selected coffee producing countries*, Common Fund for Commodities, 2000.

³¹ See, for example, UNCTAD, *A survey of commodity risk management instruments*, UNCTAD/COM/15/ Rev.2, 1998. Good explanatory and training materials are readily available from the Internet; with respect to farmers, the Chicago Board of Trade (www.cbot.com) offers excellent materials.

³² Robert W. Kolb, *Futures, Options & Swaps*, 2nd edition, Blackwell, 1997.

Box II

The importance of properly understanding of risk management markets

Most farmers in the United States use risk management markets through their physical contract arrangements with traders, cooperatives or grain elevators. This is a logical arrangement. Traders and elevators have found that they can win clients by offering more flexible marketing and pricing arrangements. Even though farmers may have the skills, not many have the time to follow futures market developments on a daily basis, nor do they have the financial wherewithal to pay the margin calls needed to ride out strong market movements.

However, a lack of proper understanding of markets by farmers, traders and elevators means that from time to time, things can go terribly wrong. This was the case in the United States in 1996, when many conflicts arose over so-called “hedge-to-arrive” contracts.¹

With “hedge-to-arrive” contracts, farmers could lock in what looked like a fixed price for future delivery (just like in a standard forward contract), but with the added advantage that when the moment of delivery arrived, they could chose to roll over their delivery obligation to a next period. For example, a farmer could sign a “hedge-to-arrive” contract for forward delivery for US\$ 2 per bushel, and then, when the moment of delivery arrived, he could chose to deliver for US\$ 2 per bushel against the contract, or sell on the cash market for a higher price and roll the position (the delivery obligation) forward. The intermediaries could lay off their risks on the futures market, so at first sight these contracts looked quite attractive.

However, a rapid increase of wheat prices brought out the hidden dangers of “hedge-to-arrive” contracts, dangers that were dramatically exacerbated by the poor drafting of contracts. Many contracts were not more than a page long, and failed to spell out mutual obligations and rights. The contracts all specifically referred to a futures market (the Chicago Board of Trade), and in many cases it was also clear that farmers would have to pay the cost of rolling over from one period into the next. It can be debated whether farmers really understood the size of this roll-over risk (after all, the management of a major firm like MG Corp. lost over a billion US\$ when they failed to take these risks into account), but it is clear that none of the parties really understood the funding risks of having large open positions on the futures market.

Take again the farmer who has sold his production through a “hedge-to-arrive” contract at US\$ 2 per bushel. Before he actually harvests his crop, prices increase to US\$ 4 per bushel, and although the farmer realizes he has made a large opportunity loss, he does not worry because he has locked in an attractive profit in any case; and if prices remain high, he can defer his delivery obligation at US\$ 2 per bushel and sell on the cash market instead. But then the elevator contacts him, informing him that he should either make physical delivery, or pay the margin calls of around US\$ 2 per bushel. In many cases, farmers had committed more under “hedge-to-arrive” contracts than they were actually able to produce in a year and, unable to deliver grain, made major losses.

¹ See, for example, Dean Baldwin, Leisa Boley and David Hahn, *Hedge-to-arrive contracts: marketing risks and legal issues*, www.agribiz.com/fbfiles/tNews/hahnha.html, May 1996.

contracts: they provide for a payout when prices fall below a certain level, giving the buyer compensation for low physical market prices. Call options, which provide for a payout when prices increase, can provide a farmer with the possibility of continuing profiting from price increases even after he has sold or priced his crops, and thus provide a good alternative to storage.³³

38. Farmers or farmers’ associations can access futures and options markets through a broker, or through their bank. Particularly in the case of developing country farmers, it would generally make sense to centralize risk management operations through an association, e.g. the marketing cooperative. Individual

³³ For examples and practical applications, see Chicago Board of Trade, *Options on agricultural futures: a home study course*, September 1989.

farmers may not produce enough to meet the minimum futures contract size, and moreover, a cooperative would be much better placed to invest in skills, information access and communication tools. Accessing markets through a bank has, in principle, great advantages compared to passing through a broker: the bank should be able to provide educational and other support, and, as it is also handling the farmer's or association's physical business, it should be able to prefinance a significant part of the risk management operations. However, while in developed countries banks are increasingly moving in this direction,³⁴ developing country banks generally lack the required knowledge and skills.

A.3 Other possible market-based price risk management tools

39. Farmers can reduce their price risk exposure by linking credit costs or input costs to the prices they will receive for their crops. Although there seem to be no practical examples of such use for smaller farmers (there are some uses by larger agricultural firms – e.g. in the early 1980s, a cotton plantation in Zimbabwe was financed with credits for which the interest rate was linked to cotton prices), financial markets have developed sufficiently to make such applications possible.

40. For example, as in the case of the Zimbabwe cotton plantation, banks could explicitly link credit conditions to price levels. Inputs could be provided on credit that only needs to be reimbursed when prices do not fall below a certain level. The financiers can lay off the resultant price risks on risk management markets (in other words, their overall proceeds will not be affected by actual price levels), and because the lenders' financial obligations are linked directly to the prices for their crops, counterparty risk is reduced.

B. Financing instruments

41. Agricultural producers often sell a significant part of their crop soon after harvest in order to obtain cash to cover expenses and other financial obligations. At that time, the prices of the harvested products are most likely lower than later in the season (with the difference being higher than normal storage charges). With efficient financing, farmers do not need to sell their product immediately after harvest to obtain cash. If goods already in storage can themselves become a vehicle for obtaining credit, pressure to sell will be greatly reduced. The situation of farmers would improve even further if crops still in the field could be used as collateral. Unfortunately, banks, even if they are interested in financing agriculture, rarely accept collateral other than land or real estate. Over the past decades, various ways to deal with this problem have been attempted, mostly with little success (box III discusses these traditional forms of agricultural finance). This section describes the various ways in which financiers could structure credits around such non-traditional collateral. In some cases, it will be possible to arrange such structures with individual farmers, without a need for the support or intervention of a farmers' association. But in most cases, farmers' associations probably play a major role either as financing intermediary or as facilitator of the transaction. Financing can come from banks, but conceivably also from the capital market (institutional investors) – in the latter case, an operator procures funds to invest in an operation from investors, by selling them formalized rights to future production. E.g., in the case of a fish ponds, these are the rights to a certain share of the fish in one pond; or in the case of a timber plot, a share of the proceeds from the sale of timber produced on that plot (and the proceeds of the sale of carbon offset rights).³⁵

³⁴ See, for example, Jon King, "Opportunities in risk management: earning loyalty, service fees and friends", *Journal of Agricultural Lending*, American Bankers' Association, Spring 1999.

³⁵ Shrimp and fish ponds in Indonesia have been financed in this manner, and in the OECD and Latin America, the timber industry alone has attracted 10-12 billion US\$ in institutional investment. It has also been used for olive plantations.

Box III

Traditional methods of agricultural financing¹

Formal financing mechanisms

Commercial banks and institutions such as merchant banks, development banks, saving banks, insurance companies, etc., are engaged in providing credit to farmers, often relying on support from the Government and/or external donors. Credit in the formal sector is either *subsidized* or on a *commercial* basis.

Subsidized credits. In virtually all developing countries, government intervention in rural credit markets has been highly prominent. In many cases, *subsidized agricultural credit programmes* were set up to provide farmers with low-cost loans and to promote agricultural development by supplying more credit to the rural sector. The main characteristics of these credit programmes were subsidized or low interest rates, imposed government lending targets and credit quotas, high operational costs and difficult bureaucratic and administrative procedures. While these programmes caused a tremendous financial burden to Governments, they did more damage than good to the development of rural credit markets.

Commercial credits. Commercial banks tend to be uninterested in agricultural finance, unless farmers provide collateral such as tangible assets - land, buildings - or any income-providing assets. This is linked to the perception that the agricultural sector is a highly risky area for lending.

Informal financing mechanisms

The informal sector, represented mainly by traders, moneylenders, landlords, grain-millers, shopkeepers, relatives, etc., meets much of farmers' credit needs. Informal loans tend to have no or few collateral requirements, relatively simple bureaucratic procedures, low transaction costs, and great flexibility in terms of reimbursement.

However, although demand for informal credit is often high, supply is limited, to a major extent because informal lenders do not have access to the formal sector to borrow money for on-lending. Lenders in the informal sector charge rates which range from zero nominal interest rates, often charged by friends, relatives and neighbours, to up to 100 per cent per month by some moneylenders. Most loans are short-term (up to one year, as the informal lenders do not have the capacity to provide long-term financing).

Semi-formal financial institutions, credit unions and cooperatives

To link the formal and informal financial markets; Governments and donor organizations have promoted the development of semi-formal institutions bound together by mutual solidarity. These institutions often provide services beyond mere credit provision. *Farmers' cooperatives* have been one way of delivering credit to farmers, with credits often tied to agricultural inputs and machinery. However, like other semi-formal institutions, they have suffered from the same controls, lack of independent decision-making, inflexibility, repression, and high administrative costs as formal financial institutions. Another approach has been the *group lending scheme*: small farmers are grouped together for the purpose of attaining a common goal (i.e. acquiring credit). Formal banking institutions support the formation of such groups and provide them with agricultural credit. The group is held liable and responsible for the total loan in case any of members' defaults. This technique leads to better performance in respect of loan recoveries and a decrease in lending transaction costs compared to other traditional mechanisms.

¹ Based on Frida Youssef, "Finance to farmers: new effective ways to explore commodity trade finance", *New strategies for a changing commodity economy; the use of modern financial instruments*, UNCTAD, September 1998. See also FAO, *Agricultural Finance Revisited – Why?*, 1998, and Jacob Yaron, McDonald P. Benjamin and Gerda L. Piprek, *Rural Finance: Issues, Design and Best Practice*, World Bank ESSD Studies & Monograph Series 14, Washington D.C., 2001.

B.1 Warehouse receipt finance³⁶

42. In warehouse receipt finance, a bank or trader relies on goods in an independently controlled warehouse to secure the credit that it provides. The warehouse operator issues warehouse receipts, in one form or another (depending on a country's legal and regulatory system), which then form the basis of financing. Rather than relying on the producer's (or exporter's) promise that the goods exist and that the proceeds of their sale will be used to reimburse the credit provider, the goods are put under the control of the independent warehouse operator (the credit provider still needs to ensure himself that the goods have not been pledged previously). The warehouseman becomes legally liable for the goods he stores. If these goods are stolen, damaged or destroyed, through any fault of his, he and his insurance companies have to make up for the value lost (additional insurance can be obtained for catastrophic events). The integrity of this warehouse operator is secured by government licensing and controls and by outside guarantees that the warehouseman has obtained from bonding companies (subsidiaries of banks which provide against defaults) and insurance companies (for a variety of risks, including the risk of fraud by the warehouse company's employees). Compared with a simple bill of sale (which gives title to commodities to the credit-providing institution), the use of warehouse receipts as collateral provides the additional advantage that the commodities are no longer in the possession of the borrower, and hence if the borrower defaults, the lender has easy recourse to the commodities. Banks or trading companies normally have few problems with advancing funds against commodities that are being stored in a reliable warehouse and have been assigned to the bank or trading company through warehouse receipts.

43. Processors and traders have made far more use of warehouse receipt finance than farmers. Farmers' use has mostly been through cooperatives engaged in exports. As will be further discussed in chapter III, there are good possibilities to enhance not just the use by farmers' associations of warehouse receipt finance, but also, because of improvements in communications and smart card technology, direct use by individual farmers.

B.2 Repo finance

44. Another innovative form of agricultural finance is the use of repos (repurchase agreements). Repos are of major importance in securities markets, where they consist of a sale of securities for cash with a simultaneous commitment to repurchase them on a future date; the buyer will apply a certain interest rate (the 'repo rate') to calculate the current purchase price as compared to the future repurchase price. This mechanism is now being used in commodity markets, primarily in the United States and some Latin American countries. In this case, the repo is the temporary sale of a commodity by the farmer to the bank in exchange for immediate cash, and the simultaneous commitment by the farmer to repurchase the commodity at a fixed future date for a pre-arranged price. The bank usually has title to the commodity for the period of the credit, and would only exchange the commodity for cash at maturity. Thus, as in the case of warehouse receipt finance, a small-scale farmer who is short of money does not need to part with his crop in times of low prices, but rather can turn to a formal financial institution for credit at a reasonable price - reasonable because the bank runs no credit risk. Repos are relatively easy to arrange and present no legal obstacles (however, in some countries they can give rise to unfavourable tax treatment – a sales tax is applied). The more sophisticated tool of warehouse receipt finance offers more flexibility, but also

³⁶ For further information, see UNCTAD, *op. cit.*, UNCTAD/COM/84, July 1996; Food & Agriculture Organisation/Natural Resources Institute, *Inventory Finance*, 1996; Richard Lacroix and Panos Varangis, *Using warehouse receipts in developing and transition economies*, www.worldbank.org/fandd/english/0996/articles/0140996; and UNCTAD, *New perspectives for commodity finance: using structuring techniques for commodity-dependent countries*, June 2001.

requires stricter preconditions. Repos can be provided on the over-the-counter market (by banks, for example ³⁷), or traded through exchanges (as is the case in Colombia, for example ³⁸).

45. A crucial element for undertaking repo transactions is the availability of reliable warehouse operators. Warehouse companies need to be financially strong, and the operators need to have the technical and business skills to store the commodities in a safe way, protecting their quality. In some cases, banks may deem it appropriate to set up their own warehousing subsidiaries to carry out a range of collateral management activities.

B.3 Assigning future receivables

46. If farmers produce a regular stream of commodities and there is relatively little risk that they will stop doing so, then a financier could ensure loan reimbursement through the offtaker of the farmers' products. For example, a sugar mill or a cotton ginnery could act as a conduit for loan reimbursement. Farmers who produce under contract with supermarkets could similarly assign their future revenue to the reimbursement of a loan. Similarly, farmers who export high-value products to an international auction could assign the payments that they will receive on the auction to the reimbursement of a loan. In all these cases, the assignment of receivables converts a credit risk on a farmer into a production risk (will the farmer be able to produce) combined with a credit risk on the offtaker (if the farmer indeed delivers, will the offtaker be able to pay?); in general, this will reassure the bank that the loan will in effect be reimbursed, and enable it to improve credit conditions. While the financing does not necessarily pass through a farmers' association, such an association can still play an important role in regrouping farmers so that they can deliver the quantity and quality of products required by a buyer.

C. Examples of use in developing countries

47. Although the use of market-based price risk management and warehouse receipt finance by farmers in developing countries is not common,³⁹ there have been a number of experiences. This section describes the experiences that farmers have had with price risk management in Guatemala, Mexico and Uganda, with warehouse receipt finance in Brazil, Malaysia and the Philippines, with repo finance in Colombia, and with receivables finance in India. There are also experiences in other countries. For example, farmers in Argentina and South Africa make active use of their countries' commodity futures exchanges. Warehouse receipt finance for farmers is used in several other Latin American countries, and it has made headway in Eastern and Central Europe, as well as Russia.⁴⁰

C.1 Guatemala – price risk management to facilitate access to finance

48. The experience of Guatemala's coffee sector demonstrates the feasibility of reaching small farmers with modern financial instruments. In 1994, the country's National Coffee Growers' Federation (ANACAFE), a private non-profit organization, introduced a coffee credit system aiming to improve the access of coffee producers to commercial bank financing. The use of risk management instruments is a

³⁷ Commodity repos are offered to western processors, traders and farmers by banks such as Merrill Lynch and ABN/AMRO. There is also a start in the securitization of commodity repos: in 1998, MBIA, the industry monoline insurance leader, "wrapped" a US\$ 230 million financing for United States cooperative grain elevators (see <http://www.mbia.com/news/press/981109.html>).

³⁸ See Jairo Hernando Arias Puerta, "Colombia's National Agricultural Exchange", *New strategies for a changing commodity economy; the use of modern financial instruments*, UNCTAD, September 1998.

³⁹ The key obstacles are discussed in UNCTAD, *op.cit.*, TD/B/CN.1/GE.2/2, 1994.

⁴⁰ See, for the experiences of a project of the Common Fund for Commodities in the Samara region in Russia, http://www.dayrobinson.co.uk/daynew/On-line_resources/BULLETIN/bulletin.HTM.

prerequisite for participation in the credit programme. It considerably reduces the risk to the banks, allowing them to provide credit to coffee farmers at lower interest rates (according to ANACAFE's estimates, this led to interest rate savings for farmers of over 10% of the loan value).⁴¹ ANACAFE is merely a facilitator: it does not provide the credits, nor does it act as a broker. Small farmers generally depend on the ANACAFE programme to obtain credit.

49. The system has the following components:

- ANACAFE provides training to farmers in different areas: helping farmers to understand and calculate their production costs; explaining to them the mechanisms of agricultural credit; and explaining the way that world markets determine the price of their coffee, and how the inherent risks can be managed. ANACAFE also provides market intelligence to farmers on a continuing basis – it distributes beepers which continuously signal the futures market price.⁴²
- ANACAFE extension staff then evaluate the production potential of a farmer, and assist him or her with the necessary paper work for a loan.
- ANACAFE provides the farmer with a list of banks with which it has an agreement, and the farmer chooses the bank. The loan application, with supporting documents, is then transmitted by ANACAFE to the bank.
- Normally, the bank would then approve the loan, but with disbursement only after the farmer has obtained a hedge (he or she can choose which instrument to use: a fixed-price forward sale, sale of futures, purchase of put options, a collar strategy, or other).
- Farmers normally hedge their price risk through an exporter with whom they negotiate a pricing formula. They are required to deliver the quantity of coffee corresponding to the amount of coffee they hedged to the exporter. Exporters manage the inherent risk by selling futures or purchase or selling options in the New York Board of Trade (NYBOT), where arabica futures and options are traded. Exporters generally pre-finance the risk management strategy: they pay option premiums up-front for later deduction from the price they pay to the farmers when they deliver coffee to them, and they finance margin calls.⁴³ ANACAFE provides information to exporters to assist them in managing the resulting risks (if the farmer does not deliver, the exporter may end up with uncovered losses on the futures and option positions), but does not give any performance guarantees. Also, it does not help exporters to obtain funds to finance these transactions. This is probably the weakest part of the system: exporters simply do not have sufficient cash to manage the price risks of many farmers.

50. All farmers in the country are, by law, associated with ANACAFE and can participate in the programme. For small farmers (and many coffee farmers in Guatemala produce less than 2,000 to 3,000 lbs, compared to a size of 37,500 lbs for the NYBOT futures contract), the possibility has been created to access risk management instruments by aggregating the exposure of several farmers. Cooperatives can also participate – for example, in one case, a 400-member cooperative, including many illiterate farmers, voted to hedge their crop on the New York market. The proportion of coffee farmers who hedged

⁴¹ Christopher L. Gilbert, Panos Varangis and Jan ter Wengel, *Industry Representational Organisations and Market Reforms in Selected Coffee Producing Countries*, Amsterdam, November 1999, <http://www.feweb.vu.nl/medewerkers/cgilbert/iro.pdf>.

⁴² ANACAFE is funded through a 1% fee that farmers have to pay on the amount of the credit they receive.

⁴³ The unwillingness of banks to prefinance hedging costs has been a major obstacle to the expansion of hedging activity by producers. It is also an important reason for exporters to suggest that farmers use collars, also known as zero-cost options: the premium due for the purchase of put options is covered by the premium received for the sale of call options – the farmer is protected against the risk of price falls, but gives up all or part of the gains of price increases.

increased from zero to around 20% in the late 1990s as a result of ANACAFE's activities. In interviews,⁴⁴ participating farmers stated that their hedging policy has been crucial for their survival.

C.2 Mexico – a government agency as risk management intermediary

51. In Mexico, a government organization, Apoyos y Servicios a la Comercialización Agropecuaria (ASERCA⁴⁵) is responsible for providing a range of services to the country's agricultural sector, including the sale of (subsidized) put and call options to grain, cotton and coffee producers, as well as to grain processors. ASERCA is part of the Ministry of Agriculture and was set up in 1991 to facilitate the conversion of Mexico's agriculture from one dominated by state intervention to a free market system.

52. ASERCA's involvement in price risk management started in 1992/1993, when it first offered grain, oilseed and cotton producers the possibility of insuring themselves against the risk of price falls; the tools used were the wheat, maize, soyabean and cotton futures and option contracts traded in Chicago and New York respectively, as well as grain swaps. The purpose in the first year was primarily to ensure that the budget available for subsidizing growers would indeed be sufficient. A programme to provide options to growers was introduced in 1994. The programme has gradually evolved and expanded since; for example, in 1999 put options for coffee farmers and call options for livestock farmers were introduced. Under this programme, farmers purchase put options from regional ASERCA offices, with ASERCA then purchasing the options on behalf of the farmer from the relevant commodity exchanges (New York for coffee and cotton and Chicago for grains and soybeans) through a US broker. In effect, ASERCA acts as a broker by aggregating the price exposure from many growers and hedging it at appropriate exchanges.

53. Until 1997, ASERCA paid two-thirds of the cost of the options and centrally managed all positions. Its subsidy fell to 50% in 1998. Until 1999, farmers also had the possibility of getting an even higher subsidy (100% until 1998, 75% in 1998 and 1999) under a savings programme, if they agreed to block the nominal amount of the premium in a dedicated savings account (an "investment and contingency fund"). ASERCA has an extensive training programme, in which it is supported by its US brokers.

54. The programme has been well received by producers. In the year 2000, 17% of wheat production was covered by put options bought under the programme, 13% of sorghum production, and 32% of cotton production.⁴⁶

55. Criticisms of this risk management programme are twofold: first, the farmer is not required to hold the purchase of the put for a specific time, so often the put is sold before his actual production is forward contracted or sold in the cash market (in the United States, USDA had a similar experience in its option pilot programmes, which also provided subsidized options). Second, the programme often resembles an income transfer scheme, transferring income from the government to farmers, rather than a strategic commodity price risk programme.

⁴⁴ Done in 2000 as part of the work of the World Bank's International Task Force on Commodity Risk Management, which used Guatemala's experience as one of the key elements in a documentary it produced on the relevance of price risk management for developing country farmers.

⁴⁵ The ASERCA website is <http://www.infoaserca.gob.mx/>

⁴⁶ ASERCA, *Claridades Agropecuaria*, No. 85, September 2000.

C.3 Uganda – cotton cooperatives' first steps into price risk management⁴⁷

56. In 1994, the internal and external marketing of cotton was liberalized in Uganda. The cooperative unions, burdened by large debts, were forced to sell most of their ginneries to the private sector. Private sector ginneries now dominate, and most cotton trade and exports are in the hands of private traders. The turnover of cotton cooperatives fell drastically, from 18,000 bales before liberalization to 4,000 bales in its aftermath.

57. At least two of the cooperative cotton unions overcame their problems by taking a more proactive role in marketing. These unions, the North Bukedi Cotton Company and the Lango Cooperative Union, started using futures and options markets, and had brokers and commission agents which communicated vital information to them on a daily basis. The first used its access to risk management markets to be able to guarantee minimum prices to its farmers. These two unions, as well as several others, also invested in Reuters screens (later, information became available through the Internet). In effect, in one way or another, virtually all cooperative unions had access to international market information on a daily basis, although this did not mean they actually understood the world market: almost half of the cooperative unions surveyed in 1997 were not aware of futures and options markets, and only 15 per cent felt they understood the way these markets operated. Some unions also used currency forward rates to convert the international futures prices into local ones, to facilitate its price negotiations in forward sales. Several of the cooperative unions engaged in fixed-price forward sales to manage their price risk exposure, although generally only for two months ahead, and rarely for more than four months ahead. None of the cooperatives appeared to be using price-to-be-fixed pricing terms.

58. Bank pre-financing collapsed after liberalization. Prior to that, banks often relied on coffee or cotton stocks as guarantee on loans, and could easily enforce their rights in the case of default; as there was only one monopoly buyer, farmers or traders could not illicitly sell stocks to other parties. Ginners tried to support cotton production by providing cotton seed and other inputs to farmers, who in return signed forward contracts under which they were to deliver their cotton to the ginnery, and the cost of the seeds and other inputs would then be deducted from the price paid. However, there was widespread default as farmers delivered to other ginneries in order to avoid reimbursing their debts (in cotton production, seed and input costs can amount to as much as a quarter of the value of the resulting crop).

59. In 1998/99, the ginners, as a group, initiated a new input credit scheme.⁴⁸ The Government's Cotton Development Organisation, responsible for regulating and promoting the cotton sector, took a leading role in this financing scheme. It obtained a credit from a commercial bank, and used this to buy cottonseed (from the ginneries who would then act as agents in its distribution), as well as inputs. These were distributed through the ginneries, but an independent collateral management company was given responsible for controlling the distribution of seeds and inputs, the receipt of raw cotton from farmers, and the shipment of lint cotton (ginneries process raw cotton into lint cotton, which is then pressed into bales which can be traded internationally). Its control ensured that deductions were indeed made for the seeds and inputs delivered to farmers, and also ensured that the banks which had prefinanced the inputs, as well as part of the costs of the raw cotton, were reimbursed. The scheme was successful, and continued operating in subsequent years.

⁴⁷ Peter K. Ngategize, *Use of commodity risk management and collateralized finance by farmers' associations in Uganda* (mimeo), UNCTAD, 1997.

⁴⁸ The following description is based on a presentation by André Soumah, ACE Audit, Control & Expertise, *Experiences with the impact of warehouse receipt finance on farmers, small traders and agricultural processors*, prepared for a workshop on Commodity Finance and Building a Warehouse Receipt System for India, organized by the Forward Markets Commission (Ministry of Food & Consumer Affairs) and UNCTAD, Mumbai, June 1999.

C.4 Brazil – CPR: a tailored instrument for commodity finance and risk management

60. Like in so many other countries, farmers in Brazil lost their access to credit when the Government withdrew from agricultural finance in the 1980s. The private sector was unable to fill the vacuum left by the disappearance of government-subsidized agricultural credit schemes, and where banks tried to breach the gap, they often found it nearly impossible to get farmers to reimburse. In 1994, the Government, through State-owned Banco do Brasil (one of the world's largest agricultural banks), decided to tackle the resulting credit crunch by introducing a new mechanism, Cédula de Produto Rural (CPR).⁴⁹ CPRs have the legal status of a bond.

61. The CPR is a pre-paid forward contract that acts principally as a financing instrument. Farmers or their cooperatives can sell their products forward to the Banco do Brasil (through a CPR) and receive a cash equivalent. CPRs are transferable and are traded in a secondary market, including through the country's commodity exchanges. Until 2000, farmers had to deliver the commodities to the Banco do Brasil, which sold the commodities through its electronic auction system or over the counter; it paid the farmer the sales proceeds minus the financing costs minus a 6-8% fee.⁵⁰ The price at which the farmer is to pay back the product is determined at the outset, normally on the basis of the futures price (Brazil has an active agricultural futures and options market, the Bolsa de Mercadorias e Futuros, BM&F), and this can result in either a fixed price or a fixed discount over a certain futures price.

62. CPRs can be issued by farmers any time after their crop is planned, and also on the basis of commodities in store. The minimum maturity is three months, and the maximum maturity is eight months. CPRs can only be issued on a fraction of the expected harvest or goods in stock. For commodities not yet harvested, more financing is available with the approach of the harvest (e.g. for arabica coffee, CPRs can be issued for up to 30% of the expected harvest between 16 January and 31 March and for up to 50% between 1 April and 30 June). For products in store, up to 70% of the expected value of the commodity is available. CPRs have been used primarily for coffee (covering about 3% of Brazil's production), but also for cotton, rice, livestock, wheat, maize, millet, soybeans and orange juice.

63. As is noted above, farmers can decide to leave the price at which they have to pay back the CPRs open, and consequently the CPRs allow price setting some time after they have been issued – from the farmers' perspective, they amount to futures contracts (without some of the hassles of using futures markets). For coffee, those issuing CPRs can also buy options through the Banco do Brasil. Consequently, they have increasingly been used as an instrument for hedging. In a survey among coffee farmers in 1999, it was found that 48% of farmers issued CPRs with as their main objective the obtaining of crops, and 28% had as their main objective the obtaining of a price guarantee; for 22%, the CPR was used to obtain both objectives.⁵¹ According to the same survey, CPRs were a relatively efficient financing instrument: in the period covered (the crop years 1996/97 and 1997/98), its effective interest rate was almost one third below going working capital rates.

64. The CPR has not been as widely accepted by farmers as could have been expected, given its effectiveness as a financing instrument. The main reasons were the high interest rates prevailing in Brazil (even if the CPRs provided much cheaper finance than other sources, they were still too expensive for

⁴⁹ A detailed description of the CPR (in Portuguese) is given by the Banco do Brasil, <http://www.bmms.com.br/html/12.htm>.

⁵⁰ Jonathan Coulter, Eduardo Leão de Sousa, João Martines, *Brazilian experience with grain warehousing services and associated marketing tools*, Natural Resources Institute, May 1998.

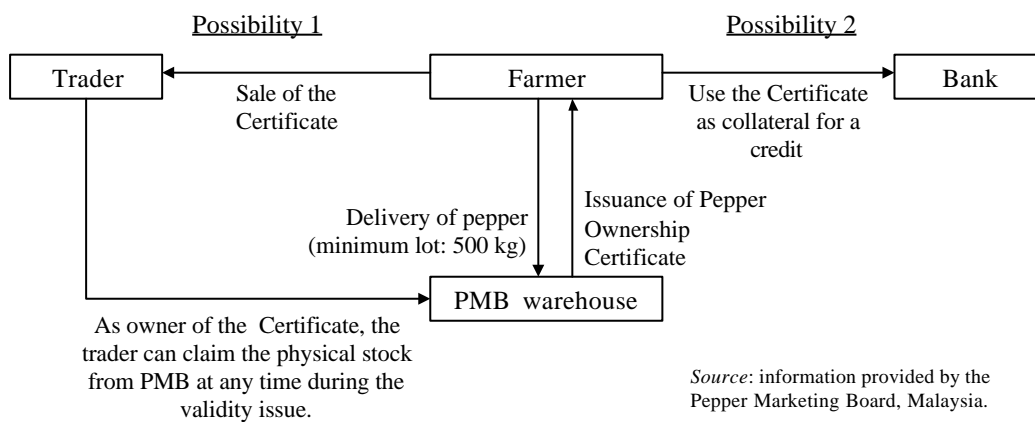
⁵¹ Bernardo Celso Gonzales and Pedro Valentim Marques, *The CPR of coffee as an instrument of financing and hedging*, paper presented at the IAMA 1999 Agribusiness Forum, Florence, Italy.

farmers) and operational problems.⁵² In 2000, the Government therefore decided to stimulate the interest of investors in CPRs (which should lead to more attractive rates) by making it possible for both farmers and traders to close out the CPR through a financial transaction. Before this, investors risked having to take delivery of the commodities. These “CPRs with cash settlement” specify the price or the price index that is to be used for determining the payment. Private sector groups are considering various other alternatives to make CPRs more attractive, including the use of Special Purpose Vehicles which would issue bonds backed by a continuously renewed series of CPRs.

C.5 Malaysia – a government agency as warehouse receipt financing intermediary

65. Malaysia’s Pepper Marketing Board (PMB) introduced a warehouse receipt finance scheme in 1998. A schematic overview is given below. Under this scheme, farmers can deliver pepper to one of PMB’s warehouses in Kuching, Sarikei or Sibul for storage during a period of one to six months. On delivery, the warehouse issues a Pepper Ownership Certificate, which indicates the name of the owner and the quantity and quality of the pepper. The Certificate can be pledged (e.g. to obtain a loan) or sold, but this needs to be registered with the PMB – the figure below indicates these two possibilities. The holders of the Certificate pay warehousing costs. The scheme has so far mostly been used by farmers as a tool for physical marketing, rather than as a financing tool.

Figure 1
The Pepper Storage and Ownership Certificate Scheme of the Pepper Marketing Board, Malaysia



⁵² Bernardo Celso Gonzales, Banco do Brasil, *Brazilian agriculture: new financing instruments*, paper presented at the IAMA 2000 Agribusiness Forum, Chicago, USA.

C.6 The Philippines – government guarantees on warehouse receipts⁵³

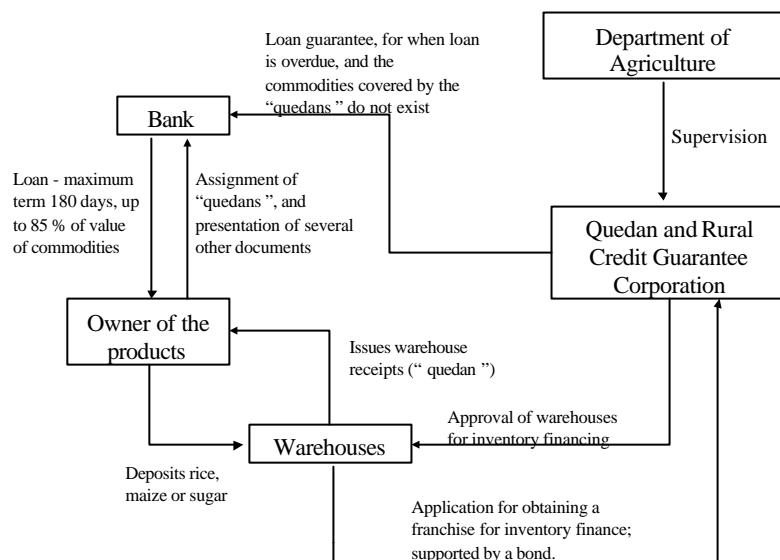
66. In the 1970s, the institutional framework in the Philippines started to have difficulties in supporting the growth in agricultural production. In particular, credit problems became an increasing hindrance to agricultural growth, as banks were unwilling to lend unless borrowers mortgaged property. To help resolve this problem, in 1978 the Government started a scheme for warehouse receipt finance, the "Quedan Financing Programme". Under this programme, traders, farmers and processors could obtain loans from banks against products in stock (initially, rice and maize, but later peanuts, sugar, coffee, cocoa, aquaculture products, root crops and various fruit products were added), with the Government providing loan guarantees to the banks. The warehouse receipts ("quedans") used in the programme were negotiable, and banks were free to discount them with other banks.

67. In the beginning, the programme was based on licensing private warehouses rather than developing public warehouses. Traders, processors and others owning warehouses could apply to the relevant government body, Quedancor,⁵⁴ to have their warehouse franchised to issue negotiable quedans. They could then present these quedans to banks and obtain a short-term loan (the maximum term is 90 days) for up

to 85 % of the nominal value of the products (with the value determined by a reference price set by Quedancor). The loans were secured by the commodities in stock, but these stocks were not independently controlled. In order to obtain the right to issue quedans, the owners of the warehouse (who in many if not most cases were also the owners of the stock) just had to issue a surety bond or provide real estate mortgages for up to 70% of the value of the quedans to be issued, and secure fire insurance.

68. In 1991, the National Food Authority (NFA) opened up its warehouses for third-party storage, which made it possible for farmers' groups (which often did not own their own warehouses) to obtain credits against goods in storage (in addition to the Quedancor programme, NFA also started its own "Grains Inventory Financing Technique" in 1994). Nevertheless, the participation of farmers' groups in the Quedancor programme remained rather limited. This was to a large extent due to the inavailability of storage space. The NFA warehouses were primarily used for the NFA's own stocks, and at times there was no space for third party stocks. Farmers' groups were also hesitant to use private warehouses, which were generally owned by traders or processors - they feared for the security of their product. And even if

Figure 2
The Quedancor programme



⁵³ Based on Gilberto M. Llanto, *The use of commodity risk management and collateralized finance by farmers' associations* (mimeo), UNCTAD, 1997; and Raul Q. Montemayor, *The role of financial instruments for commodity trade in poverty reduction: the Philippine experience*, UNCTAD Regional Workshop on Commodity Export Diversification and Poverty Reduction, Bangkok, April 2001.

⁵⁴ Quedancor's website is <http://www.angelfire.com/pq/quedan/>

a farmers' group had its own warehouse, it often found it very difficult to meet Quedancor's franchising standards.

69. Theoretically, quedan stocks could be sold forward to interested buyers, thereby enabling the owners, such as farmers, to lock in future prices. This could also result in a secondary market, which ultimately would need a liquid forward market. In practice, this has not happened. The main reason for this is that the warehouses are not independent: the warehouse operators, who generally also own the stocks, can easily divert stocks in their facilities even if the covering quedans have already been sold to third parties. Also, even in the relatively large grain market, there is a lack of commonly accepted quality standards, which makes it difficult to trade on description.

70. Despite an annual loan volume of over US\$20 million between 1994 and 1998, the programme has largely been ineffectual in enhancing farmers' access to credit. The percentage of loans granted by the formal banking system to agriculture declined from 22% in 1977-1981 to 7% in 1990 and below 1% in 1996-1998; the percentage of small farmers who were able to borrow fell from 55% in 1967-1970 to 34% in 1994-1996 (and increasing numbers of these farmers were driven from the formal banking sector to the informal sector – in 1973-1976, three quarters of agricultural credit came from banks, while in 1993-1997 less than a third).⁵⁵ Smaller farmers were generally not able to meet the requirements of the quedan system,⁵⁶ and only few farmers' groups were able to access quedan loans. The fact that farmers own relatively few warehouses of acceptable quality and the scarcity of public warehouses that they can use to store their commodities, were particularly important obstacles. In some cases, farmers might be able to obtain cheaper finance through other sources.⁵⁷ In addition, because of frequent defaults, banks do not consider quedans to be sufficiently good collateral, despite the Quedancor guarantee (Quedancor only covers 85% of the outstanding loan balance). Thus, banks impose heavy documentary requirements. Furthermore, they tend to look at borrowers' track records, and farmers' groups often have a limited track record in commodity marketing. This was even the case when the loan requests were backed by stocks in the warehouses of the NFA (a government agency).

71. A more recent programme, introduced in 1996, has had some use among farmers. Under the "Farmers' Option to Buy Back" Scheme, farmers can deposit rice and maize with the NFA, with an option to buy an equivalent amount and quantity back within a period of six months at the price paid by the NFA on delivery plus accumulated storage and handling fees. The quantities handled under the scheme amounted to just over 10,000 tons in 1997. Lack of awareness among farmers was a major reason for this, but a lack of NFA warehousing space and procurement funds was also a factor.

⁵⁵ Raul Q. Montemayor, *op.cit.*

⁵⁶ The major beneficiaries were traders and large farmers. Indicative of this is that the average of the guaranteed loans per borrower in the 1979-2000 period was US\$ 77,500 for rice growers, and US\$ 440,000 for maize growers (Raul Q. Montemayor, *op.cit.*)

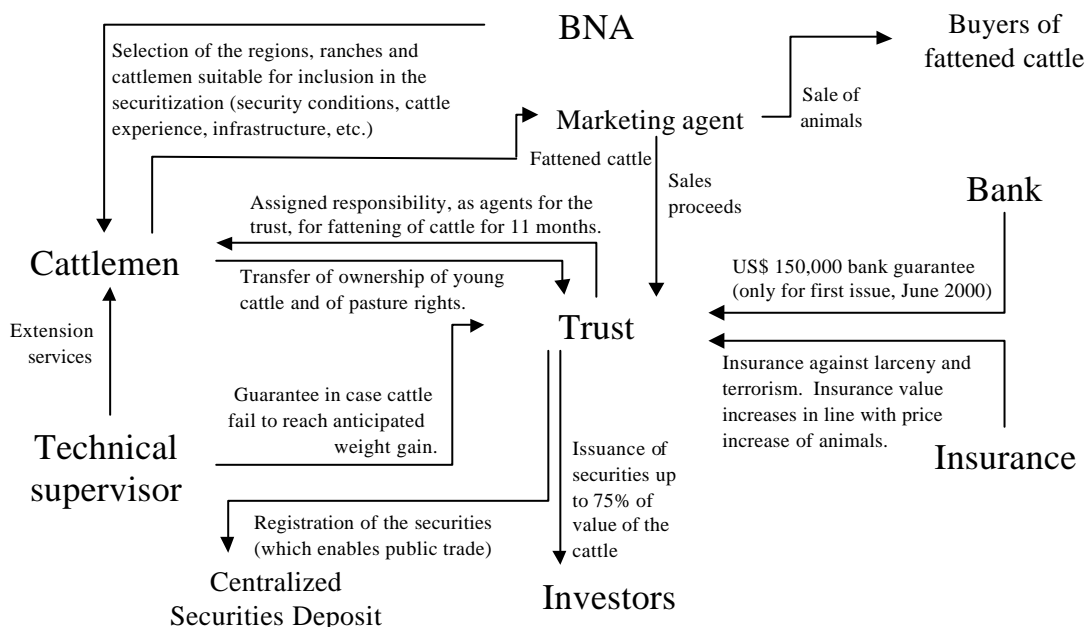
⁵⁷ In early 2001, the commercial rates were in the 16 to 20% per annum range. The rates for quedan-backed loans (which had a tenor of at most 90 days) were 15 to 18% per annum, but to this banks added a fixed 2.5% Quedancor guarantee fee; also, the required insurance on the stocks costs around 1.5% a year.

C.7 Colombia - using repos for livestock financing

72. In a transaction inspired by earlier crop securitizations,⁵⁸ Colombia's National Agricultural and Livestock Exchange (BNA) structured an innovative livestock securitization programme in 2000.⁵⁹ The programme has made it possible for cattlemen to obtain tens of millions of US\$ in financing for the feeding of their cattle. Several series of securities were successfully issued under the programme, with strong interest from both cattlemen and investors at rates that were determined through the competition among institutional investors on the country's stock and commodity exchanges.

73. Under the programme, funds for the feeding of beef cattle were raised from local institutional investors through livestock-backed securities offered and traded on the BNA and the country's securities exchanges. The structure, arranged under the overall supervision of BNA (as agent of the cattlemen) is described in Figure 3. As can be seen, the transaction was highly structured to reduce risks for the investors to the minimum. Cattlemen in selected regions who met certain selection criteria signed contracts with a Trust, transferring the ownership rights to their cattle. The Trust then sold securities on the basis of these contracts, and paid the farmers the funds received. To ensure that farmers, working as agents of the Trust, properly fed their cattle, an independent company provided extension and quality control services – and was liable to the Trust if its services were ineffective. The marketing of the cattle was controlled by an independent marketing agent, who was obliged to transfer the funds received to the Trust, which assigned them in priority to the “repurchase” of their cattle by the cattlemen (in effect, most cattle sales were through the BNA auction system). Insurance covers the risk of criminal or terrorist acts. Repos were at the basis of the financing – cattlemen sold their cattle to the Trust, and then acted as agents for the trust, before buying their animals back. Several series of securities were successfully issued under the programme, with strong interest from both cattlemen and investors.

Figure 3
Livestock financing in Colombia



⁵⁸ See Jairo Hernando Arias, “La construcción de un mercado de capitales para el agro en Colombia: la titularización de activos y otros instrumentos financieros”, *Nuevos Instrumentos de Comercialización Bursatil de Apoyo Al Desarrollo Agrícola*, Instituto Interamericano de Cooperación para la Agricultura, San José, 2000.

⁵⁹ See Federico Vélez Ortíz, *Titularización sobre subyacentes agropecuarios*, VII Encuentro de la Asociación Panamericana de Bolsas de Productos, Buenos Aires, 15-17 November 2000.

C.8 India – agricultural credit backed by sales to supermarkets

74. Since the late 1990s, a number of innovative structured finance schemes for farmers have been developed by Indian banks and other institutions (in most cases, fertilizer and other input/equipment providers have taken the initiative). These include schemes whereby inputs or equipment (e.g. tractors) are provided on credit to farmers who sell to processing plants (e.g. sugar mills), with the reimbursement of the loan through deductions to be made by the processor on the payments to a farmer. These schemes are now being operated on a pilot basis, but if successful (as early results indicate) then a fast expansion of this form of receivables finance is likely.

75. One particular form of this finance is for farmers who produce commodities under contract – vegetables and fruits meeting certain requirements for supermarkets, high-quality grains for grain millers. The financing, in this case, is part of an integrated package of services. A specialized company provides inputs, extension services, marketing services and finance. This resembles somewhat a recent initiative of a UK fertilizer company to turn itself into a provider of “fertility” rather than “fertilizer”: it takes over responsibility for fertilizing a farmer’s field, and in return gets a part of the resulting yield increase compared to the national average. Although such schemes seem to make farmers dependent on this outside player, they have generally worked very well in India, enabling farmers to increase yield and the prices obtained, while at the same time reducing input and finance costs.

Chapter III

THE WAY FORWARD

76. This chapter describes the use by farmers' associations of modern financial instruments; concretely, market-based risk management instruments and structured financing instruments (such as warehouse receipt finance) can be strengthened. This is not to suggest that this should be the core focus of work on, say, agricultural credit. There are wider actions to be undertaken, which have been sufficiently well described in publications of other organizations.⁶⁰ The instruments discussed here, however, are still poorly understood and little discussed in literature, even though they can be widely applied.

A. Possible roles for farmers' organizations

77. Even if the economic environment is far from perfect, farmers' associations can improve marketing and financing conditions for their members. Among other things, they can bring more discipline into the market place, in several ways:⁶¹

- By educating farmers on ways to trade (including on how to avoid being cheated), and providing them with information concerning markets, traders, prices, etc.
- By educating farmers on the importance of quality and the ways to evaluate quality;
- By stressing the importance of reliability in contract performance, and imposing social sanctions against those who willfully break contract obligations;
- By starting a registry of farmers who are reliable in meeting their obligations – good performance could be linked to access to some of the association's services, such as provision of inputs on credit;
- By opening a registry of trustworthy and untrustworthy traders; and
- By acting as a buyer or seller on the market, ensuring that its reputation is one of reliability. In practice, traders have little recourse against farmers if the latter default on obligations. Associations could be better counterparties, which makes forward sales easier.⁶²

78. Farmers' associations can go further than this, playing a direct role in improving members' access to warehousing and finance. There are then different possibilities:

- Creating a "cereals bank";
- Providing a framework for warehouse receipt finance, by
- Negotiating standard loan documentation with banks;
- Negotiating standard conditions (interest rate, tenor, etc.) with banks;
- Opening up a channel of communication with warehouse operators, and providing assistance to ensure that the quality of goods delivered into the warehouse is sufficiently good;
- If there are no third-party warehouses, they could consider investing in one, or better, buy or leased underutilized government warehouses;
- Explaining warehouse receipt finance and its conditions to members;

⁶⁰ See in particular Brigitte Klein, Richard Meyer, Alfred Hannig, Jill Burnett and Michael Fiebig, *Better practices in agricultural lending*, FAO, December 1999.

⁶¹ See also Olivier Combe, *The role of farmers' associations in price risk management and collateralized commodity finance*, Mémoire de Fin d'Etudes DIAA, ENSA, Rennes 1997, and *La nécessité d'introduire de nouveaux schémas de gestion du risqué de prix auprès des producteurs de café robusta en Ouganda: l'utilisation des contrats à terme*, Mémoire de Fin d'Etudes DEA, ENSA, Rennes 1999.

⁶² Also, it would enable traders to buy directly from the farmers' association rather than relying on seasonal agents to collect the sales from dispersed individual farmers. According to estimates in some countries, as many as 10 to 20% of these seasonal agents default on their obligations to the traders who have provided them with campaign finance.

- Pre-selecting eligible members on the basis of their reliability; and
- Assisting in the administration of warehouse receipt finance, so that banks are not burdened by a large number of relatively small loans.

79. They could also play a direct role in credit supply: provide joint liability or, if this is not possible, peer pressure, which would make it acceptable for banks to take crops still in the field as collateral; once harvested, the crops would then be stored in a third-party warehouse to act as further credit collateral; farmers' associations could also represent their members as credit counterparty.

80. Farmers' associations could also provide risk management services to their members. One essential precondition is that they have the legal right to do so (in certain countries, farmers' associations are generally banned from "speculative behaviour", which, if not properly defined, could prevent their use of risk management markets). One can imagine several ways for an association to provide a risk management function to its farmers:

- They can arrange, on behalf of the farmers, fixed-price or minimum-price forward contracts.⁶³ The main risk, then, is that of default by its members.
- They can arrange price insurance for their members by buying options for the price and volume indicated by farmers. This could be done before harvest with approximate sales indicated by farmers. In this case, the farmers' association is just an intermediary, buying options on farmers' behalf. If it is more advanced in stock and risk management, it could also propose to farmers a minimum price guarantee for buying their crops. The association would then have to forecast the volume that it is likely to buy.
- The association can operate a stabilization fund, putting aside reserves in times of high prices. In practice, such a fund would work best if it is partly used to buy options to lay off the risk of large price changes.
- The use of price risk management can enable farmers' associations to make their marketing policy more flexible, enabling them to improve their margins.⁶⁴

B. Obstacles to the use of modern financial markets by farmers' associations

81. Developing country farmers are unlikely to have direct access to commodity futures and option exchanges and other price risk management markets. Even in the United States, where commodity exchanges have been in existence for over a century, only a minority of farmers use the exchange in a direct manner. In the majority of cases, they use the exchanges through intermediaries – their cooperatives, processors and traders. The major obstacles for developing country farmers are likely to be:

- The futures contract size may be too large for small farmers;
- Financial requirements can be overly burdensome. With futures, one needs to put up a safety deposit, and option premiums need to be paid upfront. With futures, there is the possibility of further margin calls;
- Access to information may be insufficient: one needs to have access to market information in order to make sound buying and selling decisions;⁶⁵
- Skills can be difficult to acquire for individual farmers;
- Telecommunications may not be sufficiently good to communicate with market intermediaries;

⁶³ This implies access to the futures and options markets through traders and processors, as described in chapter 2.

⁶⁴ See, for practical guidelines, Chicago Board of Trade, *Improving margins using basis*, Chicago 1993.

⁶⁵ Information is in itself a valuable asset for farmers. For instance, in the case of Grameen Telecom in Bangladesh, farmers are able to obtain up-to-date information through their cellular phones, for example on the market price of poultry, which enables them to sell better than at a price set more arbitrarily by a middleman. (C. Burr, C. *Grameen Village Phone: Its Current Status and Future Prospects*, International Labor Organization, Geneva, 2000, www.ilo.org/public/english/employment/ent/papers/grameen.htm).

- Finding an intermediary (broker, bank) may be difficult;
- National laws and regulations may prevent or hinder use of the markets, there may be explicit bans, taxation rules may be cumbersome, etc.⁶⁶
- And last but not least, there may be considerable resistance within the farmers' association.

82. The managers of farmers' associations tend find concern among their own members when the subject of price risk management is discussed and the recommendation to begin a hedging programme is made. Even in developed countries, there is often little understanding of price risk exposure (many marketing cooperatives, for example, do not know the effects of changing prices on the day-to-day value of the commodities that they have in stock or that they are processing or transporting). Risks are poorly understood, and there is often very little awareness of the tools that exist to manage risks. As a result, this important business tool remains unutilized. Farmers' associations that are in this situation do not just need one-off training workshops, but need to bring in competent outside consultants to assist in the education process for both directors and management. These consultants must address the issues of training for the individuals involved in merchandising, accounting and management, as well as policy development for the board to ensure proper guidelines are defined for the hedging programme.

83. A first necessity is that farmers' associations properly monitor price movements in their spot markets and in futures markets. Tracking of the "basis" (the differential between spot and futures prices) helps to make better decisions on sales and pricing.⁶⁷ Committees need to be set up to devise objectives and set strategies.⁶⁸ Box IV gives an overview of the type of guidelines that a farmers' association could adopt. For training and information, a number of universities in the United States have developed good materials.⁶⁹

⁶⁶ For example, H. Fleisig, ("The Power of Collateral - How Problems in Securing Transactions Limit Private Credit for Movable Property", *Private Sector Viewpoint*, The World Bank, April 1995) shows how certain legal interventions often meant to protect the poor (e.g., limitations on the use of collateral, usury laws) effectively prevent the poor, including farmers from accessing organized financial markets. One example given is that of lending against cattle as collateral in Uruguay, which is very difficult because Uruguayan law requires each individual cow to be identified; the law does not give the financier a continuing security interest in the cattle if sold by the borrower; records with respect to prior pledges of the cattle are very difficult to search; and it would take a financier six months to two years to possess the cattle and sell it in case of a default. Fleisig discusses the same theme in Chapter 5, "The Legal and Regulatory Framework for Rural Financial Markets", of Jacob Yaron et al., *op.cit.*, 2001.

⁶⁷ For details on recording methods, see Keith Schap, *Commodity marketing: a lenders' & producers' guide to better risk management*, Chicago Board of Trade, 1993.

⁶⁸ UNCTAD has developed an extensive guide on how companies can set up a system to make productive and safe use of price risk management markets. Most of what is in this guide, as well as the sample forms provided, is also relevant to cooperatives. UNCTAD, *Company control and management structures: the basic requirements for a sound use of market-based risk management instruments*, UNCTAD/ITCD/COM/MISC.1, Geneva 1996.

⁶⁹ A large amount of materials on agricultural risk management, for a large part targeted at farmers, can be found in the following websites managed by US universities:

- University of Minnesota, Center for Farm Financial Management (<http://www.cffm.umn.edu/>);
- National Agricultural Risk Education Library (<http://www.agrisk.umn.edu>)
- Texas A&M and Kansas State Universities Risk Management Education Programme (<http://trmep.tamu.edu/cg/list.htm>)
- Michigan State University, New Economic Realities: Taking Charge of Risk (<http://www.aec.msu.edu/agecon/blackj/NERRisk.html>)
- Kansas State University Research and Extension Risk Management Education(<http://www.agecon.ksu.edu/risk>)
- Iowa State University, Managing Risks and Profits Cooperative Extension Service (<http://idea.exnet.iastate.edu/idea/marketplace/risk-mgmt>)
- University of Illinois at Urbana-Champaign (UIUC), Office for Futures and Options Research (OFOR) (<http://w3.ag.uiuc.edu/ACE/ofor>)

C. Possible applications of new technologies

84. Lack of proper institutions often makes it difficult for farmers, as well as smaller commodity traders and processors, to access modern financial instruments. The access barriers to banks can be very high indeed. Particularly because banks often do not respond very favourably to smaller lenders, procedures are often very time-consuming and awkward, and many lenders are unable to provide the documents that banks require. Similarly, while farmers and traders are in many cases aware of the prices that are determined on commodity exchanges, they are unable to actually trade on these exchanges – they lack the tools to access the exchanges, through brokers or otherwise.

85. This lack of institutions, of “local transmission mechanisms” in the wording of the World Bank’s International Task Force on Commodity Risk Management in Developing Countries (ITF), has been recognized for many years by the international community, and the traditional recommendation (including by the ITF) is to develop and strengthen the institutions that can act as an intermediary between farmers and others in developing countries, on the one hand, and modern financial markets on the other.⁷⁰ Such institutions can aggregate demand for risk management, and enter into relevant transactions on risk management markets.

86. Such work to develop and strengthen institutions is certainly extremely important. However, in certain cases, it may be that technology such as smart cards can provide a shortcut to circumvent these institutional bottlenecks and directly link farmers and traders to risk management markets. Similarly, technology could enhance the access of individual farmers to, say, warehouse receipt finance without the need to first strengthen the farmers’ association. Other techniques could be useful as well - an Internet exchange, for example, can link its trading function to warehousing operations, permitting easy financing for farmers once they have deposited their commodities in a participating warehouse and easy pricing and sale through the Internet exchange.

87. Smart cards have already proven to be a good way to reach clients who otherwise would be too small to be worthwhile for banks. They have not been linked to warehouse receipt finance and commodity risk management yet, but interesting possibilities exist. For example, once they deliver commodities to a warehousing company which is part of a financing scheme, farmers (or others) would get a smart card loaded. This smart card would act as a physical proof of their ownership of the commodities, and include details on quantity, grade, and location, as well as the status of the goods (e.g. are they pledged?). It could thus be used to generate “management data” for the farmer (e.g. calculate for them how much it would cost to install a price floor at a given level), and could also be used as collateral for loans.

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- University of Missouri (<http://agebb.missouri.edu/mgt/risk>)
 - University of Oklahoma (<http://agweb.okstate.edu/pearl/agecon/marketing>)

⁷⁰ See, for a description of the problem by the ITF, *Dealing with Commodity Price Volatility in Developing Countries: A Proposal for a Market Based Approach*, September 1999. The document can be downloaded from <http://www.itf-commrisk.org/itf.asp?page=2>.

Box IV**Sample summary hedge guidelines as established by a farmers' association's board****Section I: Position Exposure**

The maximum long or short net position of this association (including the price exposure implicit in anticipated physical production, and in stocks) shall be the following:

ARABICA COFFEE: For the period of September through December, xxx tons. For the period of January through April, yyy tons. For the period of May to August, zzz tons.

Section II: Pre-Hedge Policy

The limits on the net long and short position shall be considered applicable to the position that is held by the association at the close of its business day on any day on which the relevant exchanges are in session. If management feels that volumes over weekends, holidays, harvest periods, high activity time periods will cause the company to exceed the stated limits in position prior to the opening of the next Board of Trade session, pre-hedges may be made to cover the anticipated grain purchases or sales.

Section III: Acceptable Transactions

To obtain protection for arabica coffee inventories, to cover purchases of coffee bought from member farmers for future delivery, to maintain inventories for storage earning possibilities, and to cover the price risks implicit in forward (minimum) pricing commitments to member farmers, it is necessary to make use of the arabica coffee futures markets. Following are the policies for this activity:

1. Use of the futures market shall be for hedging purposes only.
2. Trading shall be done in the association's name and only for the association's purposes.
3. The following are deemed prudent futures market transactions and are authorized under this policy.
 - a. Futures sales to offset priced cash coffee purchased which will be delivered at a future date.
 - b. Futures sales to offset priced cash coffee purchases that have been received or are in the association's warehouses.
 - c. Futures sales to offset anticipated priced cash coffee purchases (pre-hedges), including as forward (minimum) pricing commitments to member farmers.
 - d. Futures purchases to offset sales of coffee.
 - e. Spreads from one futures delivery month to another to endeavor to earn additional carrying charges when the futures contracts being traded are supported by a coffee inventory in the association's warehouses or cash coffee purchases from producers which are to be evidenced by a contract.
 - f. Spreads in anticipation of purchases or sales of coffee, to the maximum of xxx tons.
4. The use of options to complement or in place of futures or as a normal course of business is possible, but:
 - a. When market volatility is more than yyy percent, senior management approval is required.
 - b. The total budget available for option purchases is zzz.
 - c. Options contracts are to be recorded and maintained in a current condition and as a permanent record at all times and to be considered when determining the daily net long or short position of the company.

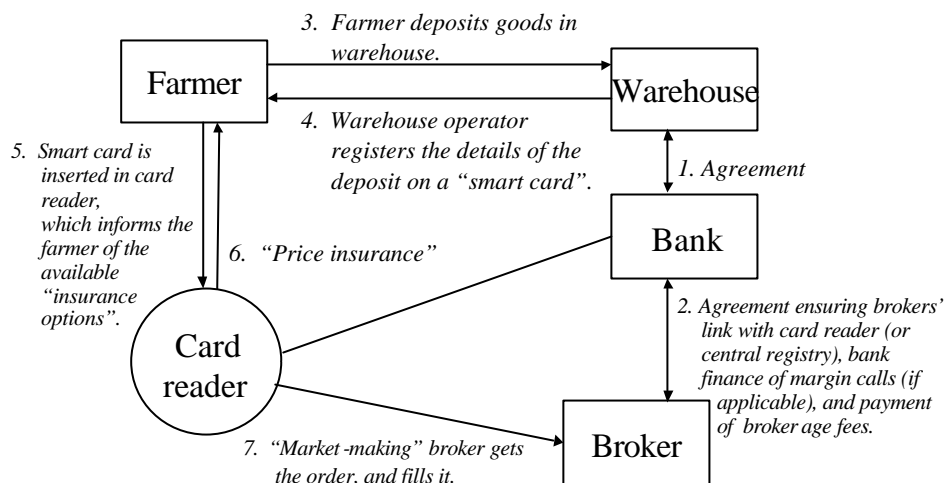
4. Section IV: Reporting

Management is responsible for reporting on the policies set forth by the Board of Directors at the monthly meeting. This should include the premium position on a monthly basis, the net long and short risk position, the exposure to basis risk and any variance during the month from the policies set by the Board.

Source: Based on ACDI/VOCA, *The use of commodity price risk management by farmers' associations* (mimeo), UNCTAD, 1996.

Chart 1

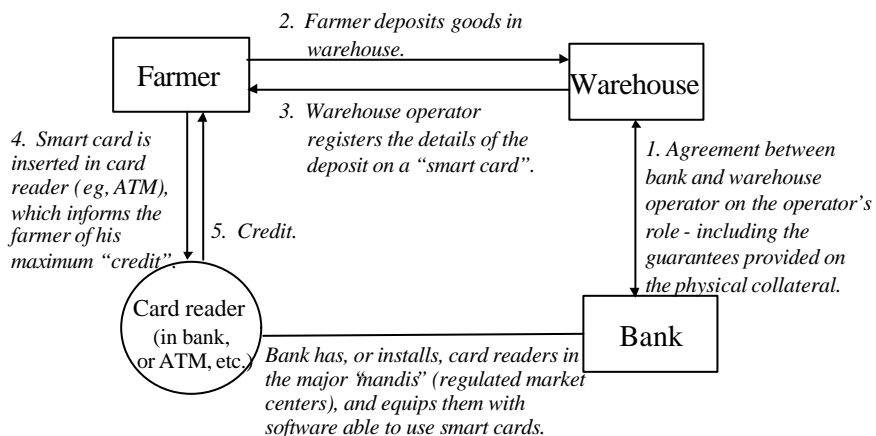
Using smart cards as a “shortcut” for price risk management



Note: This scheme applies to selected commodities with liquid risk management markets. A limited number of brokers are invited to operate as “market makers”, continuously quoting bid and ask prices for futures and, preferably (once the markets have developed) options. The system software then translates this into a price for different levels of price protection for the specific quantity and quality of products the farmer stored (the credit availability could be linked to the level of price protection). The farmer makes his choice, and this is deemed binding on the broker - which has to manage its own position as good as it can (which includes the absorption of risks related to quantities hedged which are not a multiple of the size of underlying futures/option contracts). Banks ensure margin payments, if any, which is secured by the goods in storage.

Chart 2

Using smart cards as a “shortcut” for warehouse receipt finance



Note: This scheme only applies to selected commodities, which have a ready market (that is, can be easily sold) and a reliable price reporting system. The smart card contains details on the quality and quantity of the products deposited. The card reader is connected to a system with up-to-date price information, and programmed to calculate the current value of the products; the farmer can take up to, say, 60 to 70 per cent of this value as a short-term (say, up to 180 days) credit. The credit is registered on the smart card, and delivery from the warehouse is only possible after its reimbursement. The scheme has the added value of providing an up-to-date central registry of charges over products, and allowing to create “track records” for individual farmers. With general use of the smart cards, warehouses could also use them to provide inputs on credit.

88. Charts 1 and 2 indicate how such systems could be used for financing purposes or even to buy "price insurance" or indeed enter into any type of risk management transaction. The process would be more or less automated. The farmer, or other owner of the commodities, just needs to get access to a smart card. The challenge is not really technology nor, in countries which have more or less centralized rural market places, is there much of an issue of giving farmers access to smart card readers. The real issue is to find warehousing companies and potential financiers interested in developing the system, and perhaps most importantly, develop a front-end which is easy to understand and to use even for semi-literate farmers.

89. Smart cards can thus be used to provide direct access to warehouse receipt-based finance. The involvement of a warehouse company shifts the credit risk (from the financier's perspective) from the farmer (or trader, processor) to the warehouse firm. The use of a smart card eliminates the paperwork and procedures which would be required for normal warehouse receipt finance.

90. Farmers, and even more so traders and processors, are normally quite open to new technologies if they have a demonstrable impact on their lives - one can note, for example, the widespread use of cellular telephones to gather market information. Technology is sufficiently sophisticated to build in an overwhelming number of safety features to avoid abuse of the system by warehouses, those holding card readers or others. And technology is cheap enough to make large-scale introduction possible (it would cost a warehouse not more than a few hundred US dollars to install the equipment to print smart cards, and details can be downloaded as a batch once a day to a central registry, which keeps communication costs low).⁷¹

D. The role of Governments and the international community

91. Governments need to provide an enabling environment for farmers' associations to use modern financial instruments. International aid donors should support them in this and provide training and technical assistance to cooperatives and other supporting agencies (e.g. local banks) to empower them to use the markets for price risk management and structured commodity finance.⁷² As the examples of Canada, Mexico and the United States show, Governments can also play a more important role, actually advocating the use of financial instruments by farmers through the creation of dedicated risk management agencies and setting up pilot programmes.

92. The example of the United States gives a good indication of what the international community could do. The United States Government considers risk management very important for its farmers. As stated by David Spears, Commissioner of the Commodity Futures Trading Commission (the US agency responsible for supervising futures markets), "we are entering a new era in agriculture in which it is absolutely crucial to educate farmers on current and new risk management tools".⁷³ The Risk Management Agency (RMA) in the United States was set up within the Ministry of Agriculture in 1996 as part of the Federal Agriculture Improvement and Reform Act, which set out to reduce the role of the Government in agriculture.⁷⁴ The RMA has over 500 staff and an annual budget of over US\$ 20 million dedicated to the issue of agricultural risk management – just for the development of educational

⁷¹ See for a further discussion on the potential of technology for providing developing farmers will access to modern financial instruments, Julian Roche, *Web to Wap: for a real start of the new millennium*, prepared for UNCTAD's emerging market forum at the 1999 Bürgenstock futures industry meeting.

⁷² UNCTAD has a mandate to provide such support, and in 1998 signed a partnership agreement with the International Federation of Agricultural Producers to work jointly in this area. However, UNCTAD is not a funding agency, and has not been able to develop an active operational work programme.

⁷³ Quoted in CFTC press release 4505-01, 4 April 2001.

⁷⁴ The website of the RMA is <http://www.rma.usda.gov>.

programmes for US farmers, it allocated more than \$1.2 million in grant money in the first two years of its existence. It offers crop insurance, sponsors research on risk management issues, and (in coordination with various other organizations) has an important awareness-raising and training programme to educate farmers on the financial risks inherent in producing and marketing agricultural commodities. It also operates pilot risk management programmes. Mexico's ASERCA, while not having the same resources, is another example of a Government setting up an institution to advocate market-based risk management instruments. But developing countries, where farmers are by no means faced by lesser risks than farmers in the United States, have by and large neglected to follow these examples. This is partly because the international community is not supporting such a development - the RMA has provided technical assistance to South Africa's Ministry of Agriculture, but other than that assistance in this area has been mostly absent. It may be worthwhile for donor agencies to consider the possibilities of expanding assistance in this area.

93. In promoting the use of innovative forms of agricultural finance, government entities can also play an important role. The examples given in chapter 2 of Malaysia and the Philippines show how government entities can take the lead in stimulating warehouse receipt finance schemes (and there are other similar examples; e.g. in the Solomon Islands, the Commodity Export Marketing Authority, CEMA, set up a scheme under which farmers could obtain finance from a commercial bank upon delivering their copra and cocoa to a CEMA warehouse). But Governments should also encourage private sector players to develop new financing schemes. The international community could assist by promoting an exchange of experience; for example, it can be noted that the agricultural financing scheme introduced by the National Agricultural Exchange in Colombia (in which agricultural assets were converted into bonds and sold to investors) inspired a similar initiative by a private company, Induservices, in Venezuela (which has since sold many bonds used to finance maize stocks). Both positive and negative experiences can provide helpful guidelines to those trying to introduce better schemes in their countries.

94. In conclusion, Governments and the international community can play a highly useful role in facilitating the use of modern financial instruments by farmers. Apart from general support for the strengthening of farmers' associations and the institutions that work with farmers (such as agricultural banks) and improving the legal and regulatory framework for commodity risk management and finance, Governments and donors can support targeted projects and activities – pilot projects, exchanges of experience, training programmes and the like. More than a billion people in developing countries depend on commodities for the major part of their (often very poor) livelihood. Many of these people run a serious risk of falling from poverty into destitution if the prices for their main products fall.⁷⁵ Many would be able to escape the poverty trap if they were enabled to invest in their production – and credit is an important tool for this. While enhancing access to modern financial instrument is not a panacea for this group's problems and would have only limited use for the poorest of the poor (who are often landless), it can be a useful part of the poverty alleviation toolbox.

⁷⁵ Many poor farmers who do not produce enough food for their family consumption would also suffer if the prices for the food crops that they buy increase. One can thus also make an argument to provide "insurance" (probably to be based on call options) against the risk of such price increases. This is to be discussed in a forthcoming UNCTAD paper.