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Integrated Productivity Programme for Agriculture in Mozambique

Final Report

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FINAL REPORT

INTEGRATED PRODUCTIVITY PROGRAMME (PIP) FOR AGRICULTURE IN MOZAMBIQUE

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CPP on Increasing Agricultural Production and Productivity in Mozambique

November 2011

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1- INTRODUCTION

This report summarises and details the drafting, discussion and approval process for the Integrated Agricultural Productivity Program for Mozambique. This Programme has emerged as a response from the International Growth Centre (IGC) to the request for cooperation given by the Ministry of Agriculture of Mozambique to the Director of IGC Mozambique in April 2011. This request sought technical assistance from the IGC in designing a programme which increased the production and agricultural productivity of the country in the short term. This report thus presents, in integrated form, a proposal for policy interventions with a view to raising current levels of agricultural productivity within Mozambique in the short term, i.e. the Integrated Productivity Programme (PIP).

The PIP was developed during the period from April to November 2011, in a process which included the collection of data, the reviewing of existing agricultural policies within Mozambique and internationally, the identification of agricultural potential and constraints within Mozambique and field visits. This process received constant support from the Ministry of Agriculture (MINAG),the Ministry of Planning and Development (MPD), the Ministry of Industry and Trade (MIC) and from the Ministry of Public Works and Housing (MOPH). The process also benefited, on certain occasions, from fruitful meetings with the Prime Minister of Mozambique and the advisers to the Presidency of the Republic.

Among other elements, the PIP considers the results of a field study carried out in July 2011 in the provinces of Cabo Delgado, Nampula and Tete, as well as the discussions held in Maputo with partners responsible for implementing the PIP. The details of the fieldwork and discussions are presented inAppendix2.

The time period between the request for the PIP by the Ministry of Agriculture (April 2011) and its effective approval by the Economic Council of the Government of Mozambique (July 2011) was only four months. During this period, 18 different versions of the document were drafted and 45 meetings held between a total of approximately 300 different individuals, including technicians, officials and farmers, with 10 field interviews carried out with farmers and 12 lectures given on the issue in various technical and political contexts.

This Report is organised in the following way: Sections 2 and 3 discuss the role of the State in the development process, emphasising the role of rural credit in agricultural development. Sections 4 and 5 look retrospectively at the role of agriculture in development planning among African governments in general and in Mozambique in particular. The topic of agriculture is a central concern of African governments, which at successive meetings (Maputo and Nairobi for the CAADP, Abuja and Addis Ababa for the IFPRI, and Mozambique for the PEDSA) affirmed their commitment to developing policies to strengthen their agricultural sectors by increasing production and agricultural productivity. According to these governments, this is a question of applying the Asian experience of the Green Revolution to sub-Saharan Africa, which succeeded in the 1960s and 1970s in significantly increasing production and reducing rural poverty

in the former countries. The agricultural sector in Mozambique was discussed. It was found that the agricultural productivity of the principal crops was between 50-80% less than the world average. This occurs in a rural environment in which only 3% of farmers use modern inputs and only 2.8% receive any kind of rural credit, whereas on average, in developing countries, up to 45% of agricultural GDP is funded.

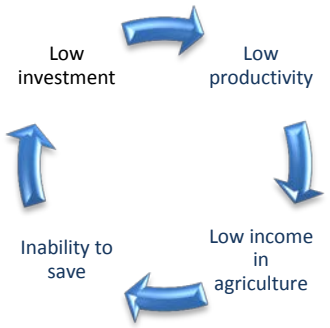
Section 6 presents in detail the operational aspects of theIntegrated Productivity Programme (PIP) proposed in this Report. Among the different types of rural development policy (markets, land, research and development), priority was given to rural credit on account of its effectiveness in developing agriculture during the initial stages of economic development. It is perceived that in order for credit to be effective, it must be accompanied by and integrated with other policies which generate positive synergies in a rural environment, such as road and storage infrastructure, input and bank logistics, etc. Rural credit must also be targeted towards operators with sufficient scale to adopt modern technologies and hence, to reimburse loans. Finally, section 7 offers a number of considerations on controversial aspects of the PIP, with a view to clarifying some of its details more effectively.

The Report is also supplemented by four Appendixes presented in a separate document. These Appendixes present regional data for agriculture in Mozambique, allowing the detection of priority local PIP clusters (Appendix 1), details of fieldwork and discussions held with partners (Appendix 2), certain aspects of rural finance within the country (Appendix 3) and successful African experiences in areas such as vouchers,mobile banks and rural insurance (Appendix 4).

2- THE ROLE OF THE STATE IN ECONOMIC DEVELOPMENT

The problem of low agricultural productivity may be interpreted within the analytical framework of the "vicious circle of poverty", a concept described by Nurkse in his classic study of 1953[1]. The vicious circle of poverty occurs when low productivity (in agriculture) generates low incomes, making it impossible for peasants to save and as a result, low investment, generating low productivity, and so on and so forth.[2] This phenomenon is described schematically in Figure 1 below.

Figure 1 - Vicious Circle of Poverty



Source: Own elaboration based on Nurkse (1967)

The vicious circle of poverty and the associated low productivity in the agricultural sector may lead to a situation which Lewis (1954) termed "economic development with an unlimited supply of labour", in which agricultural productivity is low, generating an exodus from the countryside and hence resulting in an unlimited labour supply in the cities. If, on the one hand, this flow reduces (industrial) labour costs in the cities, permitting the accumulation of capital, it also inflates food prices in urban zones and imposes the need for major investments in housing, sanitation, mobility, etc. which, in principle, could be directed towards industrialisation.[3] This fact probably explains why India and other countries with a highly elastic labour supply in the cities did not record rapid capital accumulation, and why the control of rural-urban migration within China aided its economic development.

The experience of various countries suggests that breaking the vicious circle of poverty requires a state capable of intervening and supporting the transition process

[1]Nurkse, R. *Notassobre o Trabalho do Sr. Furtado Relativo a "Formação de Capitais e DesenvolvimentoEconômico"* [Works on the study by Mr. Furtado regarding "Capital Formation and Economic Development"]. RevistaBrasileira de Economia, Vol. 7, No 1 (1953).

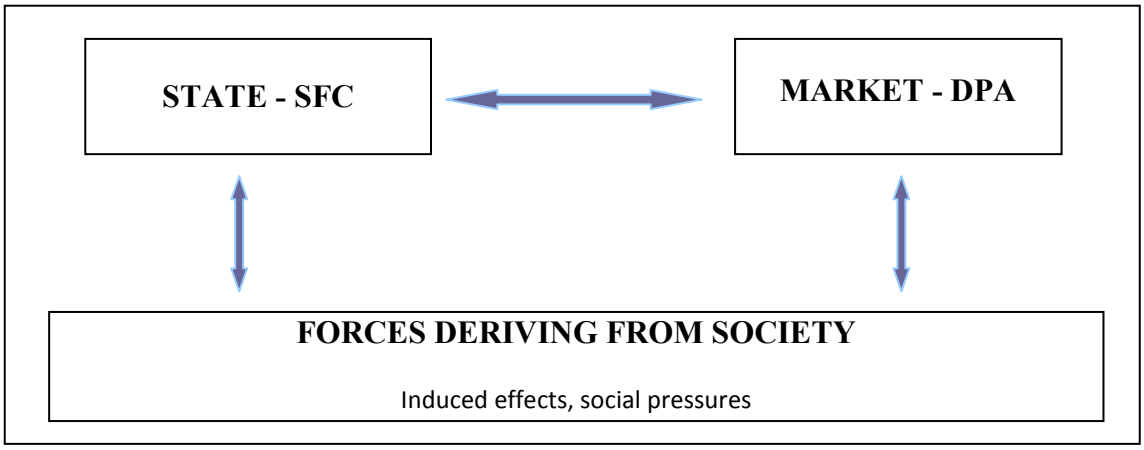
[2]Nurkse, R: *Alguns aspectos internacionais do desenvolvimentoeconômico*[Some international aspects of economic development]. In Agarwala,"Theories of Economic Development" John Hopkins, 1967.

[3]Jorgenson demonstrated that this process would generate "a low equilibrium level trap", since with a lower rural population, food production falls, raising the prices of the same and obliging urban businesses to pay higher salaries or face inflationary processes, both of which are detrimental to development.Cf."The developmenttrap", in Awarwala, op.cit.

from a traditional economy (low productivity) to an industrialised economy (high productivity). The intervention of the state in this sense, argues Rostow (1978), must be oriented towards the creation of the prerequisites for supporting the "take-off" of the economy through the expansion of fixed social capital. By reducing the capital/product ratio, the "take-off" leads to industrialisation under more normal conditions of accumulation. According to Rostow, many governments of the 1950s broke their vicious circles of poverty through the creation of the fixed capital necessary for development.

At the same time, the protagonism of the state in the development process cannot be absolute, even during its most critical phases. As Albert Hirschman[4] notes, economic development occurs through the permanent interaction between social fixed capital (SFC) provided by the state, direct production activities (DPA) of the private sector and social forces, as is illustrated by Figure 2below.

Figure 2 - Interaction between the Forces of Development



Source: Own elaboration on the basis of Hirschman (1961).

According to Hirschman, the two functions of the government would be firstly *"to initiate growth through forward thrusts that are meant to create incentives for further action*", and secondly "*to stand ready to react to, and to alleviate these pressures in a variety of areas*", with the first of these phases being the more essential one[5]. At the same time, Hirschman was sceptical about the capacity for resolving all development needs through planning of activities, since there is no such rationality in conduct at the time of deciding between priorities. The socio-economic development of

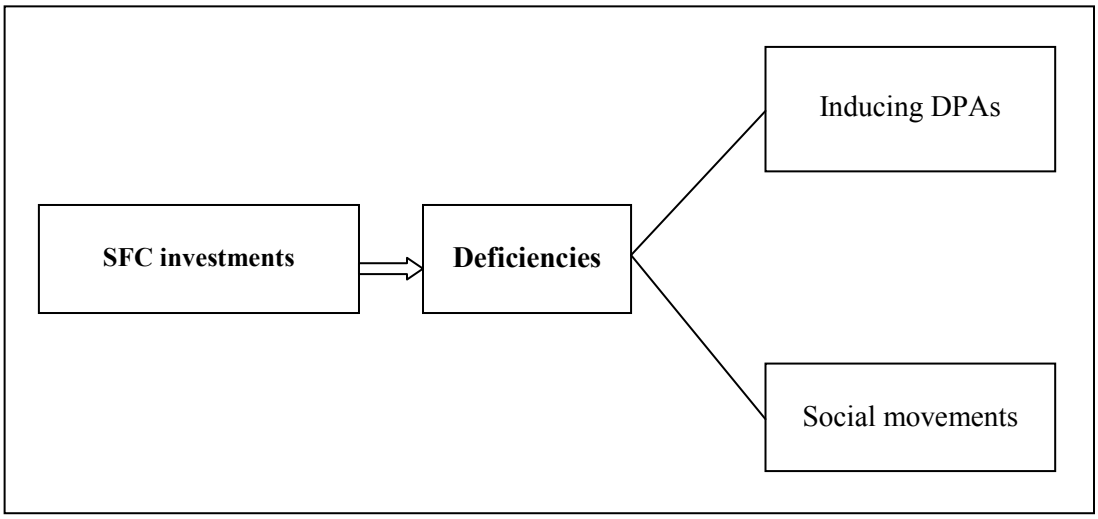
[4]Hirschman.A .Strategy of Economic Development [Estratégia de Desenvolvimento Econômico, Editora. Fundo de Cultura. Rio de Janeiro] (196, p. 123), originally published in 1958 by Yale University Press, written in 1956-7, on the basis of a reflection on his experience in Colombia. This is Hirschman's seminal and possibly most influential work, in which he criticises the concept of "balanced growth" and the planning efforts in this direction, arguing that the process of development is fundamentally unbalanced, driven by pressures and demands which accumulate and are resolved over time.

[5]Cf. Strategy of Economic Development, op.cit., p. 202.

a country will take the form and direction given by the interaction between the three forces cited above and the result will depend on the relative force of each one of them.

Given the interaction between SFC and DPAcited above, Hirschman proposes that instead of an intervention by the state which concentrates on rigid planning, its intervention should be guided by the principle of "development with shortage". With this type of intervention, the state makes initial investments, which in turn generate new disequilibria, which provide incentives for seeking solutions, on the part of both the state and the private sector, thereby giving a signal for the direction of advance in seeking these solutions (Figure 3). On the contrary, an excess of action by the state (rigid planning) may "suffocate" the population, causing it to "acquiesce", so that it loses its impetus to participate in seeking new solutions, and may "stifle" the private sector's initiatives in DPAs.

Figure 3 -Development Driven by Investment



Source: Own elaboration on the basis of Hirschman (1961).

In this way, from Hirschman's analytic framework, schematised in Figures 2 and 3 above, the implications are derived with regard to the role of the various agents in breaking the vicious circle of poverty: (i) the state carries out the functions of regulator, facilitator and booster of certain initiatives, (ii) the private sector invests, producing wealth and generating employment;(iii) civil society demands solutions for its social problems[6].

[6] The contemporary planning process has become much more complex and a classic *top down* approach would be dysfunctional in practice, without consultation or participation of civil society, which relates to Pierre Bourdieu's remark that "there is no social policy without social pressure". cf. BOURDIEU, Pierre. *The disenchantment of the world*: economic structures and temporal structures. São Paulo: Perspectiva, 1979, and Outline of a Theory of Practice, Cambridge University Press, 1977, in which the author develops a "theory of practice". In Carlos Matus, the relevant concept is "situational strategic planning", described as follows: *"My plan tests itself*

To a certain degree, AmartyaSen resumes the discussion of the vicious circle of poverty, arguing that education plays a central role in breaking it, by contributing to an increase in productivity, which is the major obstacle in poor countries[7]. The impact of the accumulation of human capital goes beyond this, generating *spillovers* (positive externalities) which may induce the long-term growth of regions and countries, pursuant to the endogenous growth theories ofRomer (1986; 1989) and Lucas (1988). A better qualified worker has a greater propensity to innovate, creating new and better projects and in this way, generating higher productivity. Consequently, investment in education contributes to improving the income of workers, through increases in productivity, as well as to the boosting of the innovative process in society, generating long-term effects on economic growth.

In addition to education, which has forcefully entered the political agenda of development in recent decades, even more recently, the institutional question took on a significant role in all of the problems of development. By explaining the reasons for the existence of fragile states and strong states, the institutionalist approach clarifies why certain policies may and must be recommended for certain countries but not for others.

One of the most serious pieces of evidence for the relevance of Institutions (and the policies which accompany them) is given by the transformations which have occurred in China since 1978, which arguably were the principal cause of its economic development over the last 30 years. Starting with the policy of economic growth, the created institutions generated certain incentives for investing in human capital, adopting new technologies and encouraging innovation, consequently generating productivity gains, as described in Acemoglu, Johnson& Robinson (2004, p. 12):

> The manner in which individuals decide for themselves to organise their societies is what determines whether or not they will be prosperous. Some forms of society provide incentives for individuals to innovate, assume risks, save for the future, seek better forms of doing things, learn and educate themselves, solve problems with collective actions and provide public goods. [Author's translation].

Different countries, at different points in their history, used similar strategies but achieved significantly different results. It has been demonstrated that in addition to the availability of natural resources and of the stock of physical and human capital, development requires the presence of institutions which reduce transaction costs and the opportunism of agents (Williamson, 1985).

In formal terms, the concept of institution refers to a set of socially accepted standards and procedures which restrict human conduct. According to North (1993), the state has the power and duty to select and disseminate good institutions. In economic terms, it has the fundamental role of coordinating policies which lead to the full

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against my opponent's plan and he is a social actor who generates creative processes. He is not simply a social agent who behaves predictably. If I want to reach my objective situation, I have to overcome the resistance of the other party or secure his cooperation. My strategies and tactics, like his, combine cooperation and conflict" (p. 286). Cf. Matus, C (1993) PlanejamentoEstratégico [Economic Planning]. IPEA, 1993).Ministry of the Economy, Brazil.

[7]Sen, Amartya : *"Development As Freedom*".Companhia das Letras.Brasília, 2001.

development of the market and its supervision. Without a governance structure based on rules and conventions accepted by the society, the opportunism of agents will manifest itself, generating transaction costs for the economy. Countries with healthy institutions tend to break the cycle of poverty more rapidly and, as suggested by Oslon (1996), examples include Botswana, Chile, Norway, South Korea, etc.

In conclusion, we have seen in this chapter that the breaking of the vicious circle of underdevelopment requires the state to take a proactive role, which is sufficiently strong to drive a *take-off* of its economy, promoting the accumulation of physical and/human capital. This role must be coordinated with the forces of the market and civil society in an intelligent manner, under penalty of repeating *top down* forms of planning, whichshowed themselves to be completely ineffective in the 1960s in most developing countries. At the same time, in order for this role to be carried out effectively, it is necessary to strengthen the institutions comprising the State, namely: laws, regulations and standards governing fundamental human rights; and architecture which facilitates the resolution of political conflicts inherent in any society via peaceful means and democratic institutions; legal structures which guarantee the performance of contracts; and organisations which guarantee the financing of the State and the judicious and transparent use of resources for the benefit of all of the population[8].

[8]cf. Paul Collier (2208) and Tim Besley&Person (2011), on the characteristics of "Fragile states", and the factors which hinder or prevent the states from playing the role of protagonist in overcoming poverty.

3- FINANCING OF AGRICULTURE

One of the major limiting factors on adopting technologies and increasing productivity is the lack of financing for production, with credit as one of the forms of financing. An influential current in economic thought (notablyKeynes) argues that credit is one of the principal levers of the capitalist accumulation/development process. Credit allows purchasing power to be anticipated, expanding the limits imposed by resources themselves, both for producers and for consumers. In this sense, credit strengthens and accelerates present accumulation. It should nevertheless be noted that credit, technological progress and accumulation are independent variables, given that current credit will be remunerated with wealth to be generated in the future which, in turn, depends directly on the success of the current accumulation process and the increase in labour productivity.[9]

Credit may be subdivided into two principal lines: credit for investment and credit for working capital. While the former permits the creation/expansion/maintenance of production capacity, the second provides resources for supporting the monetary expenses generated during the production process.

While they are treated independently by the financial system, the two credit lines are closely related. The need for working capital is directly determined by two factors: (a) the level of utilisation of installed capacity or the volume of current production; and (b) the amount, nature and content of investments. These two factors are heavily influenced by credit for investment and generate a given structure of current expenses, volume and composition, which must be supported by working capital (Buainain, Guanziroli, 1998).

Payment conditions and the rate of remuneration of credit must not only be compatible with the expected future flows of returns but also directly influence decisions of agents regarding the magnitude and nature of expenses to be financed (how much and what to produce).

[9] Through its rural loans market, estimated at around 2 trillion yuan (292billion dollars) per year, China has succeeded in serving 33% of its farmers, or around 300 million of them.(China to legalize private lending in bid to ease rural credit pressure 2009-03-04 12:38:16 GMT2009-03-04 20:38:16 (Beijing Time) Xinhua English by Xinhua Writer Cao Xiaofan). An econometric study carried out in 2008 on the basis of a representative sample of farmers in the rural provinces of Xinglonggang and Heilongjiang, in the north-west of China, showed that under credit restrictions, young farmers did not leverage their comparative advantages (greater physical vigour) in agricultural work. The results revealed that in the presence of restrictions on credit, young people did not use production inputs. Removing credit restrictions, agricultural productivity and incomes of rural families improved by 31.6% and23.2% respectively. cf. FENGXIA DONG et al., 2010.

3.1 The Role of Agricultural Credit in Rural Development

In agriculture, the fact that family farmers do not orientate their production decisions exclusively as a function of maximising profit implies that their responses to financing conditions may vary by comparison with employer producers or capitalists.For example, in the face of an increase in the cost of financing, instead of reducing the planted area and current production in order to reduce the volume of operational credit and risk, as capitalist farmers would probably do, family members may decide to diversify production and/or intensified family work with a view to reducing dependence on external resources.

Agriculture has specific characteristics which require appropriate credit instruments. Longer and more rigid production cycles make it difficult to harmonise revenue flows and expenses. Since the production process is continuous, expenses are incurred throughout the period but revenue is only realised after the harvest. The result is a discrepancy between flows of expenses and revenues and an increase in working capital necessary for supporting the production process. This rigidity and reproductive cycle, allied to the dependence on nature, increases the risks involved in agricultural production, both due to random fluctuations in the natural conditions and to the greater difficulty of responding to changes in market conditions.

The specific nature of the agricultural production cycle has two significant implications for the role of credit in agriculture. On the one hand, farmers become more dependent on credit, given the alternation between good and bad years and the consequent greater variability of agricultural incomes. On the other hand, the interest rates faced by farmers become higher, given the high risk of agricultural activity (Buainain, Guanziroli, 1998).

The facts mentioned in the previous paragraph introduce a misalignment between the loan conditions imposed by commercial banks and the conditions acceptable to farmers. While for banks, a higher risk requires higher interest rates, for the producer, the effect is exactly the opposite: a higher risk must be “offset” by lower rates and by a reduction in the use of third-party resources.

In order to reduce the risks and uncertainties involved in agricultural transactions, the banks require guarantees which ultimately may affect the goods and assets of the borrower and his guarantors. As a reaction, and also in order to reduce their risks, rural farmers develop a “conservative” and cautious attitude with regard to loans, given that negative results may cost them their own asset base. This is the fact which has justified a notable intervention by governments almost everywhere in the world, in the area of rural credit.

At the same time, while it is accepted that the risk of agricultural activity justifies the intervention of the state in the credit system, Yaron (1995) critically evaluates these interventions:

"In general, the performance of agricultural credit operations borne by the State and by donors has been below expectations. Most programmes have only reached a minority of the agricultural population and the benefits were frequently concentrated among the richer farmers. Many of the institutions established to provide credit programmes did not become self-sufficient.In addition, in many cases, the dependence of these institutions on subsidies became significant"(p. 13).

The effectiveness of the institutional agricultural credit market is often constrained by the fungibility of money. In many cases, there is weak supervision and borrowers may use funds for purposes preferable to them, regardless of the objectives promoted by political managers. Furthermore, it is more difficult to guarantee that the resources will be used to finance the investment, in comparison with other sources of financing. In this way, the intervention of the state in the credit system may generate only a partial increase in investment, especially if the profitability of agriculture is low and the farmers have another more attractive investment or opportunities for consumption.

At the same time, through effective policies and efficient management practices, according to Yaron (1995), it is possible to make a success of the official credit system. According to this author, in order to achieve this, it is necessary to apply: (a) interest rates to loans which cover the general cost of operations; (b) mobile bank operation techniques which contribute to a reduction in administrative costs in selecting projects; (c) incentives for borrowers to make opportune reimbursements in the form of interest, rebates or bonuses to those who demonstrate a good financial performance and (d) clear, efficient and simple methods for approving loans, disbursements and write-downs of loans.

3.2 Targeting of credit

An aspect to underline is whether or not there is a need to target public policies in general and the official credit system in particular. In any system of social benefits, given a limited volume of resources, the more universal the system, the smaller the portion of resources intended for given groups of the population, since ultimately, the distribution of resources of social programmes would replicate and validate the income distribution generated by the functioning of the market.

The more universal the policy interventions, the smaller the amount allocated to each individual programme, leading to a deterioration in the quality of the service provided to beneficiaries. Given that higher income groups have the option of paying for the provision of services by the private sector, it has been common to focus social programmes on the poor. In other words, given a fixed volume of resources, the more focused government spending is, the greater the effect of these expenses on the problem for which a solution is sought.

In the case of agricultural credit, both medium-sized and small (poor) farmers lack additional resources, but given that resources are scarce, it is necessary to focus

access to credit on those who can respond better to the objectives of the policy[10]. Very small farmers face various structural constraints, which must be removed before making credit available. The basis for a decision is to know whether the credit helps to remove a constraint which reduces use of production potential. In most cases, credit has to be a means through which the farmer overcomes production restrictions and not a means of survival.

When the credit is on a commercial basis, the agricultural activity of the producer in question must a priori be economically viable, generating income capable of satisfying the needs of the farmer and his family, but also permitting saving and consequently, new investments.[11]

The economic viability of the small farmer is only possible with his full insertion into the market, since: (1) subsistence production is by nature diversified, preventing a high degree of specialisation in production and hence limiting productivity gains; (2) production for the market, with consequent subjection to competitive forces, leads the farmer to seek information and greater capacity incessantly; and (3) mercantile production and the consequent generation of monetary income allows the full satisfaction of consumption requirements, which go far beyond what is permitted by subsistence agriculture (Buainain, Guanziroli. 1998).

Given that in general, in agriculture, the rate of return on investment is low and the risks are high, making credit available is not always effective in raising investment rates.

There are three alternative solutions to the problem of the low rate of return of agricultural investments: (1) raising the rate of return itself and/or reducing risk, which involves public investments in training and capacity building, an improvement in quality and location of land, promotion of partnerships with agroindustry, etc.; (2) the granting of subsidised credit, in the expectation that investments in production for the

[10]On the basis of a survey carried out in 2001 with 6,100 farmers, 2/3 of whom received PRONAF [National Programme for Strengthening Family Agriculture] and 1/3 of whom did not receive it, in 133 municipalities of Paraná (Brazil),Magalhães et al.(2005) found clear evidence of the impact of credit on production and income only in the most developed Family Agriculture group (Group D). Controlling for the characteristics of the participants (OLS) gives a positive impact of R$ 437 on the value of production and of R$ 80 in per capita income. The Propensity Score method gave a negative result of R$ 1,820 and of 42 per capita. The positive effect occurred in group D, which witnessed growth in its production by R$ 2,647 and in its income by R$ 852. In general, the impact of the PRONAF on income and productivity was allegedly modest. The low degree of integration into the markets was one of the factors. At the same time, in group D, the impact was significant, revealing the need to focus credit policies on those with better conditions for making productive use of them. Sacco dos Anjos (2002) found similar evidence: when a generic measurement is carried out, without differentiating the internal subgroups of family agriculture, the effect is modest, but when differentiated, group D had positive productivity indices as a function of the credit. In another survey, carried out for the region of Pernambuco, Magalhaes et al.(2005) found similar results: a null effect on groups in general and a positive effect in income group D, with a higher income among family farmers.

[11] Production of cereals within Brazil rose from 50 million tonnes in 1980 to 146 million in 2010, using practically the same planted area (the area rose from 40 million hectares to 47 million in 2010). This fact reveals that the increase in production was almost exclusively due to productivity gains during this period. (Guanziroli, 2010, p. 4).This increase in productivity was achieved in part by virtue of the credit flow from the National System of Rural Credit (SNCR), which facilitated an important modernisation process for the sector through the incorporation of technology.

market will become profitable; and (3) the State assuming risk through the creation of a Guarantee Fund.

The problem with subsidies, and especially with a very high subsidy rate, is that it "sets its stamp" on a low rate of return. In reality, it contributes to this low rate of return by encouraging the farmer not to give his best efforts. In addition, when the subsidy extends to the principal party, the farmer may allocate the credit funds to the purchase of consumer goods or production for self-consumption, given that he does not need to create capacity for future payment. The best way out appears to be to invest in capacity building (Alternative 1) and to create guarantee funds which reduce the risks to farmers and the banks.

4- THE AGRICULTURAL SECTOR IN MOZAMBIQUE

Since the post-independence period, Mozambique has been seeking to boost the agricultural sector, considered in the Constitution of the Republic as the "basis of development" of the country. After the proclamation of national independence in 1975, given the national and international socio-political context of the time, the Government of Mozambique opted for planned economic management, as opposed to an economy subject to the forces of the free market. In this way, the policy interventions in the agricultural sector were under strong protection by state-owned companies. At the same time, the management weaknesses revealed by state-owned companies, without dismissing the destabilising effect of the Civil War, led to the collapse of the agricultural sector, making the country highly dependent on food imports.

Given the apparently unsatisfactory performance of the centralised planning system, at the end of the 1980s, the government of Mozambique opted for the liberalisation of the market, with the support of the World Bank and the International Monetary Fund. A few years later, after the signing of the General Peace Agreement in 1992, there was a massive return of displaced individuals to their regions of origin, in most cases, rural ones. As a result, there was a relaunching of and growth in agricultural production, leading to the emerging perception within the government and by NGOs of a need for integrated actions, principally with regard to marketing of agricultural products.

The first post-conflict programmes essentially focused on subsistence agriculture, assuming that the target group consisted of a homogeneous group of rural producers. This resulted in the conception of activities in a linear fashion, which excluded some significant actors within agriculture, such as emerging commercial farmers and the private commercial sector. On the other hand, the absence from these programmes of an infrastructure component led to the payment of low prices to farmers, with the result that these did not expand their areas under cultivation or increase productivity. In this way, a period of stagnation of production and productivity began, which has extended to the present day.

Seeking to revert the stagnation, in 2003, the agricultural sector initiated discussions which led to the approval of various plans, such as PROAGRI I, PROAGRI II and the Agricultural Intensification and Diversification Programme. At the same time, these programmes did not deepen the inter-sector coordination necessary for dealing fully with the production chain, an aspect which resulted in the lack of harmonisation and alignment of efforts of the various parties intervening in the chain. As a consequence, the programmes did not have the desired effect in terms of increasing the planted area and production.

Subsequent to this, the National Green Revolution Strategy (ENRV) was designed in 2005 and strengthened in 2006 under the motto "Increase cereal supply and

reduce imports" (MINAG, 2006).[12] Among the initiatives to be included in a Green Revolution programme were the following:[13]

a. Creating an environment favourable to investments in the agricultural sector;
b. Promoting and expanding formal and informal systems of rural credit, which make agricultural products viable;
c. Supporting private funding initiatives for the agricultural sector, encouraging the banking sector to develop a greater presence in rural zones.
d. Establishing efficient macroeconomic policies (monetary, fiscal, tax, currency and credit),which promote the agricultural sector;
e. Promoting initiatives for Guarantee Funds, Credit Lines, Credit Funds, Risk Capital and agricultural insurance, as well as making these operational, on a more commercial basis and less as the extension of the Government and Donors;
f. Increasing the collaboration of programmes with existing Funding Programmes, seeking synergies and common objectives.
g. Expansion of the global resource base for the financing of agricultural activity, with the involvement of cooperation partners.

A few years later, in 2008, without disregarding the ENRV, the international increase in the prices of agricultural commodities led the Government to approve the Action Plan for Food Production (PAPA), which focused on a significant reduction in the cereals deficit over a three-year horizon.

Despite the fact that ENRV and PAPA were guided by a more holistic philosophy, in many cases, there was excessive intervention by the State, both in the attribution of credit and in the provision of inputs, to the detriment of the performance of these activities by the private sector and by financial institutions.

In order to improve policy interventions in the agricultural sector, the Government recently (April 2011)approved the Strategic Plan for the Development of the Agricultural Sector (PEDSA), which shall orient the actions of the agricultural sector during the period 2011-2020.This plan will serve as a long-term guideline for

[12]In June 2006, African countries signed the "*Abuja Declaration on Fertilizers for an African Green Revolution*" with which they undertook to increase the use of fertilisers from 8.0 to 50.0 kg of nutrients per hectare by 2015, when the average during this period lay between 5 and 10kg.
The commitments made in this meeting were as follows:
1. Immediate commitment to provide funds to national budgets permitting the financing and implementation of the African mechanism for financing fertilisers via a directed and intelligent system of subsidies, using *vouchers,* for the delivery of inputs with the participation of the private sector in importing and distributing the same within the framework of government subsidy programmes. 2. Exploring alternative sources of revenue to facilitate the elimination of taxes and tariffs on fertilisers. 3. Increasing and expanding agricultural resale networks. 4. Increasing the availability of financial resources with the sharing of risks for importers and distributors of agricultural products. The government must also introduce legislation to improve access to foreign exchange for importers and credit guarantees for commercial banks which finance agricultural dealerships.
5. Developing and implementing regulatory policies for the fertiliser industry.

[13]These initiatives sought to repeat in sub-Saharan Africa the experiences of Asian countries with land shortages, which recorded increases in production between 1960 and 1990 on the basis of the technologies of the Green Revolution, with positive impacts on the reduction of poverty and food insecurity.

agriculture in Mozambique, in coordination with the CAADP (Global Programme for the Development of African Agriculture), which is the agricultural development programme representing the initiative of various East African countries. It is intended that PEDSA will achieve growth in agricultural output averaging at least 7% per year. The sources of growth will be productivity (tonnes/ha) combined with an increase in the area under cultivation, seeking to boost yields in priority crops, with a 25% increase in the cultivated area for basic food products by 2020, so as to guarantee the sustainability of natural resources (PEDSA, 2011).[14]

Recognising that producers are constrained by access to seeds, fertilisers, animal and protection products, the PEDSA proposes to expand the program for developing a network of input suppliers (agreed by the head of African states in Abuja in 2006). This program has the potential to create rural entrepreneurship along the agribusiness chain (Cf. Appendix3).

According to the PEDSA, there is the need to develop a new approach on two fronts:

- Directed government support for producers through traders of agricultural products in order to remove the producer from the poverty trap.
- Commercial credit to producers, traders and processors of agricultural products with a view to expanding scale and competitiveness.

At the same time, despite successive pronouncements, plans and programmes approved by the various ministries, the Government of Mozambique has not yet succeeded in securing sufficient resources to put these into practice.In 2009, the resources intended for agriculture represented only 5.1% of the total expenditure of the State Budget (slightly higher than the 2008 percentage, which was only 3.5%), but still far below the 10% target agreed at the Maputo Conference in 2003.

From a reading of the different agricultural plans and programmes drawn up in Mozambique, it becomes evident that the effective implementation of a programme for increasing agricultural productivity has to consider a number of important aspects, namely:

a) The Programme has to include initiatives in the field of production, such as access to credit, e.g. with initiatives in the area of marketing (storage), logistics for transporting production (roads) and logistics of input supply.

b) The Programme must be decentralised, giving a prominent role to the financial and private marketing sector and leaving the State principally with the attributions of a guarantor of risk and provider of liquidity for the system.

[14] The AGRA (Alliance for a Green Revolution in Africa) initiative, which has projects in 15 countries of sub-Saharan Africa, including in Mozambique, intends to double the incomes of 20 million small producers by 2020, through support in increasing production through the use of genetically improved seeds. The initiative is being led by Kofi Annan, Secretary General of the UN from 1997 to 2007. (http://www.ft.com/cms/s/0/9806e84a-f655-11e0-86dc-00144feab49a.html)

c) The Programme must concentrate on the sectors of agriculture with the greatest response capacity in terms of productivity (emerging producers).

4.1 – The role of Research & Development in Agriculture

The increase in agricultural productivity helps to reduce poverty through three channels. Firstly, it increases returns to agricultural workers, the majority of whom are poor. Secondly, it reduces food prices, which in turn increases real incomes and reduces poverty in urban areas. Thirdly, it drives development through the interlinkages of the agricultural sector with the rest of the economy. It is hence fundamental to support interventions which lead to rapid growth in productivity, consisting principally of supplying and disseminating appropriate technologies and modern inputs, through research and extension. In this way, research and development assisted in generating hybrid high-yield varieties of rice, wheat and maize which resulted in increases in incomes throughout Latin America and Asia (The Green Revolution - cf. Box 1). Research nevertheless becomes effective when adequate technology reaches farmers and is approved by them (IIAM 2006).

Box 1: The impact of Green Revolution technologies[15]

"Green Revolution" is an expression used for the first time in 1968 by William Gaud, the then Director USAID for IPM (Integrated Pest Management), to describe the transformation of agriculture in many developing countries which led to significant increases in production in productivity during the 1940s and 1960s. This transformation occurred as the result of agricultural research and expansion programmes, which led to a greater intensification of production, i.e. the use of high yield varieties, irrigation, fertilisers, pesticides and the mechanisation of agriculture.
In Mexico, in 1960, Mexican and American scientists led by Dr. Norman Borlaug improved highly productive varieties of wheat (varieties which were not flattened by the application of fertilisers and which permitted two sowings per year). The Mexican government invested heavily in infrastructure, with massive adoption of new varieties. In a few years, the country became self-sufficient and began to export wheat. As a corollary of the efforts of the two governments, the CIMMYT (International Wheat and Maize Improvement Center) was created with the support of the Ford and Rockefeller Foundations. In 1960, these Foundations created the International Rice Research Institute (IRRI) in the Philippines, whose high potential varieties were spread to Indonesia, Pakistan, Sri Lanka and several countries of Latin America and North Africa (MINAG, 2006).

The second country which experienced the Green Revolution was India. Making use of the experience and partnership with the two Foundations, the Indian government imported large quantities of wheat and rice seeds to start the Green Revolution. In addition to the improved seeds, the programme included the development of irrigation and the financing of agrochemicals. At the end of the 1970s, rice yields rose by 30%, relieving the famine which had stricken the country since the 1940s, while production of grain increased by 3.5% a year throughout the 1980s, aiding in reducing poverty.

To date, the greatest success in terms of agricultural growth and poverty reduction has emerged from the Green Revolution in the Far East, South East and South of Asia. This applies in particular to China and India, which together represent 40% of the world's population. The dramatic increases in agricultural yields were associated with new varieties of high yield crops (of rice and wheat), irrigation and the use of inorganic fertilisers and pesticides. In parallel, the company is committed to heavy investments in rural infrastructure, expansion, agricultural research, credit systems for the purchase of inputs and in

grain markets. The Asian Green Revolution contributed to the supply of low-cost food, which in addition to high rates of economic growth, led to a reduction in poverty. Indeed, poverty rates fell from over 50% at the start of the 1970s to 35% in the 1990s. Public sector interventions in the development of agriculture (with fertiliser subsidies and credit) and rural infrastructure were decisive factors for growth and poverty reduction.

In addition to reducing poverty, from 1990 onwards, these transformations generated a commercial surplus of 7.2 million tonnes/year of rice, 1.3 million tonnes/year of wheat, 2.1 million tonnes/year of coarse cereals and 1.7 million tonnes/year of oilseeds. The major growth in production of the Green Revolution was due, among other reasons, to the use of credit to finance access to water, use of technologies, seeds and technical assistance[16]. It was allegedly access to credit which increased agricultural productivity and the use of modern inputs, contributing to the stability and growth of the agricultural subsystem.[17]

Box 2:

In Brazil, until 1970 it was only possible to plant soybeans in the South, as it was a crop for temperate and subtropical climates. Technology played a decisive role in the progress of agribusiness within Brazil, notably in the case of soybeans, permitting the current spread of this product throughout the states of the North and North-East regions of the country.

Interested in the expansion of soybean production, in 1975, the Brazilian Government created the Centro Nacional de Pesquisa de Soja [National Soybean Research Centre], today EmbrapaSoja, which sponsored the introduction of the National Soybean Research Programme, the purpose of which was to incorporate and promote the isolated research efforts spread throughout the South and South-East.

In a short time, the scientists of EmbrapaSoja not only created specific technologies for the soil and climate conditions of the country, but also managed to create the first genuinely Brazilian *cultivar*, developing a *germplasm* adapted to tropical conditions and which permitted its cultivation at any location within national territory, allowing soybeans to be produced in tropical regions (savannahs), where the plantwould not previously grow. In addition to the soybean varieties, EMBRAPA Soja also developed integrated techniques for managing invasive species and pests, which permitted a significant reduction in the quantity of pesticides used for controlling them. At the same time, studies on soybean nutrition led to better management of fertiliser application and liming and the selection of effective strains of Bradhyrizobium spp. Furthermore, work on soil management and crop rotation resulted in the almost complete replacement of conventional sowing with direct sowing, with positive effects on the sustainability of production systems. Finally, the agroclimatic zoning of crops developed by EmbrapaSojaallowed the indication of the most suitable areas for the production of soya beans within the country.

Due to their nature as a public good, research services have generally been financed by governments. At the same time, research performance may be improved significantly when there is coordination between public and private sector research. It is important to note, with regard to the role of technology, that the obstacle to agricultural development is not the unavailability of appropriate technology but the absence of financing mechanisms which transform agriculture into a sufficiently important market segment to stimulate the production and supply of technology and agricultural services.

It is also important to note that a single technology may contain elements both for and against family agriculture (in the case of Mozambique, for emerging farmers). Effectively, technologies related to biotechnology, such as transfer of embryos, more intensive forms of monitoring of phytosanitary control (MIP), the creation of new forms of exploitation for pre-existing natural resources (domestication of high value-added plants for the cosmetics and pharmaceuticals industries) represent examples of innovations which create technological opportunities and make room for family agriculture. In order for this to occur, it is necessary to combine technological innovations with the introduction of incentives, of which credit is one.

At the same time, the process of encouraging innovation and adding value to family production units must take a number of important elements into consideration (Souza, Buainain, Guanziroli, 2005). The first of these relates to the need for scale in generating a technology, i.e. the feasibility of a technological undertaking (production, marketing, adoption and diffusion) requires the existence of an adopting market which is sufficiently large for the requirements of scale (which are highly variable, in terms of agricultural technologies).

The second point, which is a consequence of the first, relates to the need for interaction between technology supply and demand, on a different plane from the familiar model of "let us gauge the demand'. While all applied research has to"listen to the demand", it is necessary to seek compromises between the party imposing the demand (producers), those parties doing research (researchers and their institutions), producers (the entrepreneur), marketers (the trader) and in certain circumstances, the party providing assistance services (official ATER, ONGs) (Souza, Buainain, Guanziroli, op. cit.).

The third element is the creation of forums or institutional networks for organising and disseminating innovations in the research system. The importance of this element lies in the fact that there is a weak connection between research and financial circuits (i.e. connecting to existing circuits or innovating and creating new circuits), and its integration into local systems of science, technology and innovation.

As in many poor countries, in Mozambique investment in research and expansion would permit an increase in productivity and profitability for a significant portion of family farmers, the so-called "emergent" farmers. In this way, whenever possible, it is important for the context of Mozambique to favour labour-intensive production technologies so as to promote the indirect effects of increases in productivity on poor farmers.

While its importance is acknowledged by the Government, agricultural research in Mozambique has faced serious challenges in recent decades. Its research infrastructure was devastated by the Civil War which also decimated the cattle population. Poor access to animal traction and to improved technologies, particularly

inorganic fertilisers, substantially reduce the probability of area expansion and intensification of production.

Aware of its financial and management limitations, the Instituto de InvestigaçãoAgrária de Moçambique [Agricultural Research Institute of Mozambique] (IIAM) established priorities permitting the rationalisation of costs and the avoidance of waste (IIAM, 2006). The definition of such research priorities resulted in the establishment of two programmes with a 20-year time horizon: the manioc and maize programmes. These two crops represent around 50% of the value of production and 55% of potential for relieving income-based poverty in the family sector.

An increase of 20% in the productivity of both maize and manioc forms the basis of a reduction in the severity ofincome-based poverty by around 20%, and results in a reduction in poverty exceeding 5% in 34 of the 80 districts covered by the InquéritoNacionalaosAgregadosFamiliaresRurais [National Survey of Rural Family Groupings]. The average reduction in national policy is 6-7% for each of these basic agricultural products. The degree of reduction in poverty estimated for maize and for manioc is four times higher than for groundnuts, the third most important product for poverty reduction. In addition to these two products, the research programme of the IIAM also supports cultivation of sweet potatoes and sesame and goat breeding (IIAM, 2006).

Insofar as Mozambique is unable to develop very extensive scientific research, given its financial and management limitations, the IIAM has also encouraged the transfer to Mozambican agriculture of technologies developed within the region and in other parts of the world. The principal examples of technologies transferred to Mozambique include improved varieties of maize from neighbouring countries, notably Zimbabwe, a wide range of adapted varieties of beans from Columbia, varieties of cotton with a higher percentage ofginning from West Africa, vaccines from the project financed by Australia for combating Newcastle Disease in poultry, control of diseases affecting cashew trees through a spraying programme which was successful in Tanzania and charcoal production technology from Thailand (IIAM, 2006).

In this working approach, which is appropriate to the possibilities of the country, the IIAM is continuing to exploit opportunities for technology transfer and for the identification of local solutions for the problems and opportunities of Mozambican agriculture. Indeed, before shifting to the production of proprietary technologies with greater scientific innovation, entailing more financial resources, which in Mozambique are scarce, the IIAM can do a great deal more in the area of transfer and adaptation of technologies which have proven effective in other countries.

4.2 - Technical Assistance and Rural Extension

The presence of technical assistance determines the possibility of access to credit, since without it, it is not possible to draw up a technical project which meets the demands of financial agents, an indispensable prerequisite for seeking funding. Once

credit has been made available, the farmer will become dependent on capacity building and assistance to develop the project and replicate it as a farmer. In this way, the question of technical assistance and rural extension (ATER) is an issue which, while still lacking a consensus solution, has been in vogue in debates on public policies directed towards family agriculture.

Despite its acknowledged importance, the ATER system has been under pressure for a long time on account of its supposed ineffectiveness in reaching a considerable portion of poor farmers in developing countries. This crisis reveals itself in the loss of public legitimacy of extension, in the associated budget problems, in the limited opportunities for action, in the loss of assets and in the low rate of recruitment of new staff. In addition, there is also a wide debate which questions the traditional paradigms which historically have oriented action on extension.

Against traditional approaches, under which public extension services identified their target audience as a function of criteria and considerations of macro type and then "incorporated" this into technical assistance and development projects, there is an increasingly broad consensus that farmers should be genuine protagonists in such projects. The traditional top-down and/or supply-oriented approach is being progressively replaced by a systemic demand-oriented approach, requiring that farmers take an active role in every stage of the process.

At the same time, the change in approach is still in progress and remains incomplete in almost all of the poorer countries. Without clear definitions regarding its attributions and methods of implementation, the ATER system will be obliged to advance in a more relevant direction, such as a massive programme for the incorporation of modern technologies via agricultural credit. This is a problem which typically derives from a lack of management capacity, as is the case in the majority of fragile states. For this reason, in order for ATER to succeed in occupying a significant position in the scale of priorities of an agricultural productivity programme, more rigorous management and quality parameters will have to be incorporated, at the same time as coordination with the private sector and/or third-party companies is improved.

Within Mozambique, rural extension activity began in 1987 with the creation of the Serviços de ExtensãoPública [Public Extension Services] ((DNDR/DNER/DNEA), which had the mission of "promoting sustainable agricultural development and the well-being of rural families, guaranteeing the flow of useful information to and from producers, in a form which represents their interests and satisfies their needs". At the time, these services nevertheless had very limited areas of operation and technical staff and restricted themselves to disseminating messages on "sowing in lines, new varieties (OPV) and specific pest control" , without including training in the use of technological packages deploying modern inputs. With the creation of DNEA/SG2000 in 1996, packages were introduced which included certified seeds, agrochemicals and the implementation of modern agronomic practices.

Given the limitations of the public extension system in many parts of the country, private sector and NGO providers of extension services were called on to collaborate. The pluralistic provision of extension services was formally acknowledged in 1998, when the then Extension Master Plan was approved. Indeed, many national and international NGOs operate in agricultural extension, and their principal contributions to the National Extension System are: (i) greater geographical coverage and a higher number of producers reached; (ii) the promotion of participatory learning approaches; (iii) training of producer and community groups; (iv) promotion of best practices (Source: Ministry of Agriculture, National Agricultural Extension Directorate, Extension Master Plan[*], 2007-2016).

Within Mozambique, there are less than 1,000 technicians in the official extension network to service over 3 million farmers. In 2010, the public extension network covered 86 of the 128 rural districts only partially, while NGOs were present in 116 rural districts, with 57 districts having extension services also provided by the private sector (DNEA, 2010, ASP, 2005).As a result, the MINAG initiated a pilot outsourcing activity intwo districts (Nicoadala, in Zambézia and Murrupula, in Nampula) with the following objectives (i) comparing the efficiency and effectiveness of different extension services; and (ii) gradually replacing public extension, in the event that the contracting providers were more efficient and equitable. (Ministério da Agricultura Direcção Nacional de Extensão Agrária Plano Director de Extensão 2007-2016)[*].

More recently, in 2011, the MINAG announced a "Programa de Transferência de Tecnologias no Sector Agrário"[Agricultural Sector Technology Transfer Programme], intended to be an innovative instrument for bringing modern technologies to peasants. The focus of the programme is in demonstrating the use of technologies, in which the investigator and the extensionist shift to applying the model of "teaching by doing". Consequently, each extensionist will have a model area of around 1 ha, where he shall produce directly, applying improved technological packages recommended for investigation for a given geographical zone. The extensionistshall receive orientation from researchers responsible for the generation of technological packages for transfer. An interesting aspect of this methodology is that the beneficiary of the technology demonstration package becomes the legitimate owner of the resulting production, having to establish the necessary connections for placing his production in the market.

4.3 – Regularisation of Land

Within Mozambique, land ownership has been and at times continues to be the object of intense debates. Under the current law, the land belongs to the state and cannot be sold or mortgaged. Attempts to alter this provision in the 1990 Constitution

[*]Ministry of Agriculture: National Directorate of Agricultural Extension - Extension Master Plan], 2007-2016

[*]*ibid.*

and in the 1997 Land Law were rejected (Hanlon, 2002). In general, proponents of privatisation argue that individuals have to own their land in order to invest in it, that mortgaging land is the only way for farmers to obtain credit and that a landmarket is necessary for transferring it to more productive users. One of the reasons why the formalisation of land rights may help to achieve positive agricultural results is the incentive that the legal guarantee provides for investments in agricultural holdings.[18]Opponents argue that "privatisation will lead to "privation" of land after one or two poor agricultural harvests, that there are other forms of credit and that in any case, Mozambican banks are not interested in land mortgages". This debate has encouraged the reopening of the debate within Mozambique on the Land Law.

According to Cambaza (2000), within Mozambique, there were pressures for a revision of Law No. 6/79 of 3 July 1979, theLand Law, so as to adapt it to the "new political, economic and social situation and to guarantee access to and security of land ownership, both for Mozambican peasants and for the national and foreign investors" .

At the same time, according to Cambaza (2000), the Land Law recognises customary rights and attributes them the value of formal legal rights, at the same time encouraging the private sector to obtain rights of land use. The Land Law has the aim of permitting local communities and private sector investors to negotiate agreements linked to rights of land use, limiting the role of the state to guaranteeing the application of certain minimum regulations within the context of these negotiations and to permitting that the registration of rights comply with technical standards and that the taxation system functions effectively. It is envisaged that the benefits to local communities will take the form of payments or benefits, resulting from the negotiation of the use of 'their' natural capital by third parties (Cambaza 2000).

The spirit of land legislation establishes that community lands correspond to lands used by members of the community in all its dimensions, in order to achieve its objectives of providing a livelihood for current members and for future generations. A local institution will take certain decisions on land management for these lands and natural resources; for example, members of this institution shall be consulted when outside parties attempt to gain access to land, or are called on to witness internal land transfers.

In general, local institutions which manage community lands are strongly rooted in customary structures, with dominant lineages exercising decision-making powers. On several occasions, traditional leaders have succeeded in influencing the process of

[18] Within Mozambique, an increase of 5% in total land ownership would significantly increase income from crops by 2.1% in the North, 2.8% in the Centre and 1.5% in the South. When a careful analysis of the factors determining overall land ownershipwas carried out, it was observed that the use of animal traction increases total ownership of land by 13.8% in the Centre and by 18.5% in the South. (MINAG 2006).
In this way, a significant constraint on greater land ownership appears to be the low use of animal traction in the Centre and its virtual absence in the North (attributed to the spread of trypanosomiasis by the tsetse fly and to the lack of experience in the care of working animals).

demarcation of community land in order to strengthen their 'political position' (Simon 2010).

An individual or a company which does not occupy land and requires authorisation to use it must present a development plan and 'consult the respective communities for the purpose of confirming that the area is free and unoccupied'; titles cannot be issued for land which is already occupied.[19]A provisional authorisation, valid for five years, is given to Mozambican companies and individuals and a two-year authorisation to foreigners. The development plan must be implemented during this period. If this is done, the applicant will then receive a title. Provincial governors may approve requests for up to 1,000 ha, the Ministry of Agriculture and Rural Development for 1,000-10,000 ha and the Council of Ministers for areas exceeding this, albeit only as part of an agreed land use plan. Elected municipal governments shall control the issue of titles in their areas of jurisdiction(Houlton, 2002).

The title to be obtained is named DUAT (right of land use and exploitation), which attributes exclusive control of the land. The only difference lies in the fact that rights of occupiers are permanent (even without a formal document of title), while an outside investor will only be granted a title valid for 50 years, which may be renewed for a further 50.

Land is subject to taxation, although family and local community agricultural properties are exempt. For other lands with title, the annual tax ranges from 15,000 mt/ha (currently 65 US cents per hectare) in special cases, up to 60,000 mt/ha (US$2.60 per hectare) for leased land of over 1,000 hectares (Houlton, 2002).

The land belongs to the state and may not be sold or mortgaged. Attempts to alter this in the 1990 Constitution and in the 1997 Land Law were rejected (Hanlon, 2002). In general, proponents of privatisation argue that individuals have to own their land in order to invest in it, that mortgaging land is the only way for farmers to obtain credit and that a landmarket is necessary for transferring it to more productive users. Opponents argue that "privatisation will lead to "privation" of land after one or two poor agricultural harvests, that there are other forms of credit and that in any case, Mozambican banks are not interested in land mortgages".

There are two other ways of transferring commercial agricultural properties. If the land is in the name of a company, it may be sold. Land may also be leased to others without the approval of the government and apparently, there is no reason why a leased plot of land cannot be sold and mortgaged, with this common in many countries,

[20] The highest returns for agricultural productivity are frequently the results of investment in roads.In Ethiopia, access to roads reduced poverty by 6.9%, with an increase in food consumption of around 17%. In a publication by the ADB (Rauniyar&Kanbur 2009), rural roads were cited among the most effective investments for reducing rural poverty. Despite the fact that half of the rural population of southern Asia lives an hour from a market, almost half of African farmers still live five hours or more from a market. Not only are there few rural roads, but transport costs in Africa are among the highest in the world, representing around 77% of the cost of exports. The World Bank has made extensive efforts to build roads, warehouses, ports, routers and trading platforms.

including the United Kingdom (Hanlon, 2002). There is also a third market, which is 'an efficient market between poor people'. Within rural communities, land is leased, sold, cultivated on a 'metayer' basisand transferred in various ways. In general, trees have owners and constitute an important asset, being bought and sold; sometimes land is also transferred. Normally, however, the transfers only occur within the community and do not endanger the essential assets of the group; 'empirical proof of this is in the fact that normally, a peasant will not sell his basic plot of land' (Hanlon, 2002).

A discussion document on 'Land Policy' by the Department for International Development (DfID) of the United Kingdom, published in April 2002, supports the Land Law of Mozambique, regarding it as 'innovative' and a model which 'grants clear rights to local individuals in the light of the law, with opportunities to negotiate with private investors for development purposes' (Hanlon, inDfID, 2002).

Hence, while the pure right to absolute ownership of the land does not exist in Mozambique, there are apparently no major institutional obstacles to access, transfer and security of land ownership. While the transparency and efficacy of the regularisation process for land ownership may be questionable in some segments, access the land is not appear to be an obstacle to increasing agricultural productivity for plots which have already been demarcated and taken possession of (otherwise known as 'machambas')by emerging farmers.

4.4 - Rural infrastructure and infrastructure for access to markets

Infrastructure for transport, storage and access to markets, in addition to access to water, represents an important challenge for the development of agriculture in Mozambique.

It should firstly be indicated that thedeficiencies of roads are detrimental to the capacity of rural families to access the goods and services necessary for improving production and market access for the outflow of their products, significantly increasing transaction costs. Especially in the Centre and North of Mozambique, traders limit themselves to operating on the principal roads, due to problems of accessing the interior. The distance to a market averages 15 km and over 20 km in the provinces of the North. Trunk roads are in relatively good condition, except in the areas affected by flooding and in parts of the North. The major problem remains access roads between the principal highways and villages of the interior. While there has been considerable support from donors since the end of the war, it is estimated that more than 10-12,000 km of rural feeder roads still require improvement.

Within this context, it should be indicated that within Mozambique there is no transport sector dedicated to agricultural commodities. Major traders have their own vehicles, while small, informal traders use precarious means of transport (chapas) [vans] with waiting times varying from 1-2 days to 2 weeks.

The warehousing of agricultural products, which until several years ago was the responsibility of the Instituto de Cereais de Moçambique [Cereals Institute of Mozambique] (ICM), is today entirely privatised. The ICM maintains a large warehouse in operation, but it is now leased most of the time to private operators. Major operators only have warehousing facilities in the principal cities, with these being rare in the interior. Rural shops and cantinas [very small shops] had some warehousing capacity in the past, but the majority of these were destroyed and their restoration is a slow process. Warehousing on the machambas [plots of land] is a major problem, with losses due to pests and deterioration.

Government support for accessing markets has in the past been provided by parastatal marketing companies (MINAG, 2006). The effect of purchasing actions on guaranteed food prices and the resale to the public at subsidised prices in the domestic market may nevertheless have increased price instability instead of reducing it: in Zambia and Malawi, the management of imports by the government contributed to rising prices above the import parity on several occasions over the last decade (MINAG, 2006). Poor management of the cereals reserve of Malawi in 2001 caused enormous increases in prices during the marketing season of 2001/02 (MINAG, op. cit.). The fundamental reason for this result was the inability of the government to commit to following a less discretionary policy based on clearly defined rules with auditing and permanent supervision, which provided the system with transparency and reliability.

The unpredictable behaviour of the government results in a high risk for private operators, reducing incentives for trading and warehousing which, if permitted, could satisfy a large part of the food security objectives targeted by governments (NEPAD, 2004). Ultimately, both producers and consumers are the losers. Since there is no incentive to invest in private marketing and warehousing, the market does not grow and the prices which ultimately hold for producers are low, despite discretionary minimum prices. Consumers have also faced greater instability in cereal markets, related to the available physical quantity and the price. Hence, in the majority of cases, experience with strategic cereals reserves and the ad hoc commercial policy accompanying these has been unsatisfactory to date in this part of Africa (NEPAD, 2004).

Byerlee, Jayne, and Myers in MINAG (2006) suggest that risk management mechanisms, such as systems of deposit ("warehouse receipt systems") based on the market and privately managed, can improve competitiveness. These (a) provide better access to formal credit markets through verifiable collateral loans with guarantees, (b) facilitate private warehousing and seasonal management of price risk and (c) make marketing of food crops more efficient as they function as clearing houses, which acknowledge the rights of ownership over stored food and guarantee the performance of contracts.

The linkages of the market are extremely important in this process. Information related to input markets and final products must be obtained for the private sector and for family producers, in order to permit their active participation in rural trade. In

addition, tax incentives must be considered for commercial agents operating in rural zones, in order to promote a sustainable increase in rural trade.

In the case of electrification, this only reaches the district capitals. Almost all (120 out of 128) have access to energy, but areas of the interior are entirely lacking in such access, leaving them on the margins of many services considered as essential to life with a minimum level of comfort. At the same time this inhibits productive economic activities.

In terms of access to sources of drinking water, only 36.3% of the population living in the rural zones of Mozambique have a relatively guaranteed supply, while millions of people are still without acceptable access to water. The principal impact of water supply to rural zones is an improvement in the health of individuals. The location of water sources close to communities, on the other hand, releases them for income generating activities, since populations, principally women in rural zones, no longer have to travel long distances on foot in search of water, with a direct effect on the level of dropping out of school among girls.

Despite these deficiencies and the acknowledgement that an increase in productivity and a rapid reduction in poverty depend principally on investments in the provision of these public goods, the allocation of funds has been limited.[20]

At the same time, governments should not be completely absent from these markets. The relevant question is not, however, how to end the involvement of the government in food markets, but how to structure this involvement in such a way that it has positive effects on the long-term development of the market. On the one hand, additional investments in road and rail infrastructure would help to reduce transaction costs in agriculture, as has previously been seen. The long-term development of markets nevertheless helps to create a more stable environment for producers, traders and society in general.[21]

4.5 – Barriers to Agricultural Development

With 60% of the population living in rural areas, more than 75% of the population being employed in agriculture and the percentage of GDP represented by

[20] The highest returns for agricultural productivity are frequently the results of investment in roads.In Ethiopia, access to roads reduced poverty by 6.9%, with an increase in food consumption of around 17%. In a publication by the ADB (Rauniyar&Kanbur 2009), rural roads were cited among the most effective investments for reducing rural poverty. Despite the fact that half of the rural population of southern Asia lives an hour from a market, almost half of African farmers still live five hours or more from a market. Not only are there few rural roads, but transport costs in Africa are among the highest in the world, representing around 77% of the cost of exports. The World Bank has made extensive efforts to build roads, warehouses, ports, routers and trading platforms.

[21] Mozambique is in an extraordinarily strong position to benefit from the activity of the private sector to stabilise prices in time and in space: the country has large ports and transport corridors in the North, Centre and South. The recent construction of a bridge linking the surplus region of the North of the country with the Centre of the country will reduce transport costs and give even greater vigour to the private sector; this active sector is already linking the surplus regions of the North of the country with the Centre of Mozambique, Malawi and Zambia and also links the deficit region of the South with the central zone of Mozambique and with South Africa (IIAM, 2006).

agriculture being around 30%, the growth of the agricultural sector in Mozambique is important for social and economic reasons (IFPRI, 2011). As has already been seen, both the PEDSA and the CAADP have suggested the introduction of financing vehicles for harvests as a way of increasing the use of inputs and thereby improving levels of agricultural productivity.

The financing of harvests makes sense if we consider that the number of beneficiaries of rural credit in Mozambique remains extremely low. During the 2007/2008 agricultural season, only 28,808 families received credit from the government and NGOs and a further 64,440 received credit from agroindustry and rural intermediaries, amounting to 93,248 families. This number represents less than 3% of the total number of rural producers included in the Inquérito de TrabalhoAgrícola [Agricultural Labour Survey] (TIA) of 2008. Indeed, Mozambique is far below international levels in terms of financing of its activities. As the following table illustrates, Mozambique finances less than 25% of its GDP, while other poor countries, such as Bolivia, Kenya, Vietnam and Namibia all have almost 50% of GDP financed by public or private sources.

Table 1 - Credit as a percentage of GDP in selected countries

Country	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Mozambique	9.16	12.22	10.25	8.14	8.30	8.08	10.06	13.95	22.32	24.07
Brazil	72.49	74.49	74.02	72.61	74.48	86.59	92.24	96.91	97.48	97.81
Malawi	15.79	15.41	16.01	16.04	16.63	14.14	16.61	27.45	32.04	
Tanzania	8.46	8.86	7.30	7.45	11.56	11.30	13.52	17.03	18.15	20.92
Germany	144	142.4	140.7	137.8	136.1	131	124.5	126.3	131.8	130.8
Namibia	43.46	42.15	46.50	49.60	55.59	52.56	48.47	43.16	44.71	48.43
South Africa	184.34	159.82	163.12	169.62	178.49	192.93	195.34	172.92	184.39	182.32
Kenya	37.55	40.34	39.81	40.22	38.40	37.98	37.34	40.52	44.81	52.34
Cape Verde	68.10	72.38	72.80	72.19	70.36	74.94	73.24	78.29	78.75	76.88
Vietnam	39.73	44.79	51.80	61.93	71.22	75.38	96.19	94.53	123.01	135.79
Bolivia	60.55	61.12	58.10	52.95	71.27	57.47	53.51	48.36	49.51	49.03

Source: WDI and GDF 2010

Carrying out the same analysis for the financing of agriculture, the situation is even more serious in Mozambique. India, Brazil and Pakistan finance around 45% of agricultural added value every year, while in Mozambique, the same percentage does not even reach 5% of public or private sources.

Poor access to credit for agriculture is also clear when the TIA data broken down by province is analysed. In the provinces of Niassa and Tete, where the credit granted by agroindustry was more significant, the percentage of farmers with access to credit was only 6% and 7% respectively. With regard to credit granted to women, the South region of the country is the one which generally reports greater access, while the provinces of Cabo Delgado and Niassa, which are predominantly Muslim regions, tend

to report lower access. Against this, apart from credit, which is normally for financing expenditure, there is no system which finances agricultural infrastructure, with this possibly influencing medium and long-term growth.

Poor access is also a problem for the distribution of seeds. At national level, only 5.8% of rural producers have access to seeds. The provinces with the highest level of access are Gaza (19%), Maputo (18%), Sofala (14%) and Tete (8%).

The services provided by rural extension with regard to agricultural price information are also very limited in Mozambique and do not cover many farmers. Table 2 below is enlightening on this point. While, in recent years, information via radio has reached an increasing number of farmers, with as many as 31.5% of rural farmers nationally and 58% of the population of Nampula, only 6.6% of these have access to price information via the rural extension services.

Table 2 – Market and Finance: Access to Services

TIA item	% of total number of farmers
Information received from the extension system	13.3
Price information received by radio	31.5
Price information from associations	2.7
Price information from extension services	6.6
Price information from publications	7.0
Other sources of price information	11.7
Member of some agricultural association	4.5
Women taking part in associations	53.0
Credit from governments, NGOs or banks	0.9
Credit from agroindustry or rural intermediaries	2.0
Credit received by women	24.2
Seeds received during the last campaign	5.8

Source: Own elaboration on the basis of the TIA 2003. INE.

The above table also shows that associations[22] between farmers are still in their infancy at national level. Only 4.5% of farmers are members of any agricultural association, although in some regions, percentages are higher, as is the case in Gaza (9%) and Maputo (16%).

In summary, the agricultural and rural sector in Mozambique lacks basic elements for production and income generation. In 2008, there were 3.7 million rural producers cultivating an average of 1.44 ha. Of these producers, only 6% used animal traction, only 1.6% used tractors and only 2.2% used natural or chemical fertilisers.

The rate of adoption of modern technology is very low. Total consumption of fertiliser is estimated at an average of 4-5 kg/ha for crops such as sugarcane and tobacco and in marginal quantities for food crops. Pesticides are used in very limited quantities:

[22] Importance of associations... (CLAUDIO)

only some 5% of farmers use them, principally for the production of cotton and tobacco, with some extension to cashew trees and vegetables, especially in the emerging production of Irish potatoes in a number of rural areas (PEDSA, 2011).

The constraints cited above are responsible for the low degree of development of the agroindustrial sector in Mozambique and its inability to compete in the international market. In general, small processing units are only profitable if they are located close to centres of production and consumption. Links with the market are very limited in some regions of the country, reducing incentives for increasing production and evolving from small to medium-sized operations.

Indeed, there are currently 3,725,042 rural producers within the country, of which only 21,693 may be considered as medium-sized (more than 10 hectares under cultivation), with the remaining 3,703,350 producers representing smallholdings of farmers whose contribution to the market is only 20.0% for maize, 15,8% for rice, 4.4% for sorghum and 28.6% for groundnuts. Of all producers, only 3.3% use fertilisers and 2.9% some kind of pesticide (TIA, 2008).

Linked to the fact that family incomes are limited in a rural context, the above constraints leave productivity levels well below international averages. It should also be noted that the low productivity in Mozambique also results from traditional farming practices. Many plots are still cultivated using manual labour and tools, with minimal use of improved seeds (10.0% for maize, 1.8% for rice), chemical inputs (4-5%) and animal traction (11.3%) (TIA, 2008). In the current environment in which agricultural production takes place, characterised by the low use of agricultural inputs, productivity within Mozambique oscillates between one fifth and one half of the world average, as is illustrated in Table 3 below.

Table 3 - Agricultural productivity in Mozambique: International comparisons

Product	Production (ton)	Area (ha)	Productivity (ton/ha)	International productivity (ton/ha)
Maize	2,178,842	1,812,717	1.2	5.1
Rice	271,402	238,778	1.1	4.3
Sorghum	409,745	670,096	0.6	1.5
Pearl millet	51,602	113,642	0.5	0.9
Groundnuts	157,685	372,964	0.4	1.6
Beans	263,771	543,324	0.5	0.8

Source: Preliminary notice, MINAG and FAO STAT 2008.
NB: * includes all types of beans

Not only is productivity low, but regional interconnections are poorly developed in rural zones, marketing channels are weak, there is a lack of market information,

cantinas [very small shops] were destroyed during the war, transport capacity is lacking, feeder roads are few in number and in poor conditions of accessibility, rural extension only reaches 16% of all of the countries districts, land is starting to become scarce in certain parts of the country (e.g. Manica) and cannot be used as collateral for obtaining credit, since it is not privately owned (IRAM, 2003).

For all of these reasons, few resources have been channelled into agriculture and loans available from commercial banks carry high interest rates, require solid guarantees and are short-term, making them inappropriate for generating and developing agricultural businesses.

This situation has the effect of causing a shortage of food in the market which, in turn, generates adverse macroeconomic and social consequences: inflation and social tensions. Mozambique nevertheless has great potential for agricultural development: it has a surface area of 799,380 km^2 with 36 million ha of arable land that is not effectively exploited. According to the 2008 TIA, a total of 5,223,100 hectares are cultivated in the entire country. There is hence a margin of almost 90% of arable land to be exploited, above all in the North and Centre regions of the country, where soils are better and rainfall reasonable for agriculture.

Better exploitation of the country's agricultural potential and the consequent increase in productivity may be achieved, among other ways, by increasing the supply of credit, as is recommended in the IFAD[23] report:

> "There is growing demand for a broad system of financial services which guarantees saving facilities to rural producers, working capital loans, loans for investment, consumption and even financial transfer services. There is also growing demand for credit for non-agricultural activities, the development of which is hindered by the lack of investment and working capital resources. Small intermediaries and rural merchants are also suffering the consequences of lack of access to credit and to financial resources" (IFAD, 2004).

4.6 - Prioritisation of policies

As has previously been seen, there is a variety of policies which may be adopted to promote rural development in general and the increasing of agricultural productivity in particular. At the same time, in developing countries, there are financial and management (institutional) limitations, which prevent the implementation of policies at the same time or with the same intensity. Consequently, some prioritisation and focusing becomes extremely necessary in weighting the various possible policies.

In the case of a research and development policy (R&D), as previously discussed, this will be more effective if priority is given to products which are in strong demand among the population and for which an increase in productivity is essential. Taking this principle as a guideline, the Instituto de InvestigaçãoAgrária de Moçambique (IIAM) orients its R&D towards only two products: manioc and maize.

[23]IFAD. 2004. Country Strategic Opportunities Paper (COSOP)

Another priority policy for rural development is agricultural credit, essential for producing an agricultural productivity shock in Mozambique. In the absence of an agricultural credit policy which guarantees risk and working capital, it is probable that the use of modern inputs will remain stagnant for a long time and productivity will not increase. It is nevertheless necessary for access to credit to be accompanied by the restoration and improvement of the structure of roads and warehouses. In addition to guaranteeing an outlet for all production within the country, this infrastructure allows better prices at producer level.

Also within the sphere of prioritisation of policies, it is essential to develop warehouse receipt systems to replace the system of government purchases of agricultural products and minimum prices. This system has not worked in any African country.

Finally, access to secure ownership of land, a fundamental requirement for the realisation of investments in agriculture, may and must constitute one of the priorities for increasing agricultural productivity. While the Land Law of Mozambique does not guarantee the right of ownership, it guarantees the right of possession for 50 years, which may be renewed for another 50, in practice meaning the holding of secure rights. On the other hand, the Law guarantees the permanence on the land of traditional communities, which could otherwise be expelled from their place of residence, generating a flow of migrants which would be unsustainable for the country.

In summary, there are a large number of policies which directly or indirectly affect rural development. Some of these policies, such as agricultural research (R&D) and the regularisation of land, have long-term effects and should not be overlooked in a plan which considers rural organisation and development in a systemic way. These do not, however, affect productivity in the short and medium term.

Other policies are essential for this increase in productivity. Without seasonal rural credit which permits the acquisition and use of modern inputs, without technical assistance which guarantees that emerging farmers and/or peasants can apply modern inputs at the right time and with the correct doses, and without roads and warehouses which permit an outlet for and the sale of production, an incentive programme for increasing productivity is doomed to failure.

For this reason, the next section presents a proposal for an integrated productivity programme, based on these essential policies, namely: the provision of agricultural credit, construction and restoration of roads and warehouses, technical assistance and rural insurance, as well as financial architecture which permits the operational implementation of the programme.

5- PROPOSAL FOR AN INTEGRATED PRODUCTIVITY PROGRAMME (PIP)

As previously indicated, the PEDSA is a strategic plan which establishes general guidelines on the policies which need to be implemented in Mozambique in order to guarantee the development of the agricultural sector. At the same time, due to its generic character, like all strategic plans in general, it does not provide details of the proposed policies or convert them into anything operational.

One of the guidelines of the PEDSA is to increase agricultural productivity "by improving the capacity of actors along the whole of the value chain (farmers, processors of agricultural products, traders) in order to participate in the domestic and international markets, with seasonal credit for viable farmers in order to finance the harvest through the commercial banks with government support" (Pillar 2, result 2.5) (cf. Appendix 3).

With a view to contributing to the achievement of this general objective of the PEDSA, at the request of the Mozambican government, IGC devised a proposal for prioritising policy actions, following these up in the form of a programme named *ProgramaIntegrado de Produtividade* [Integrated Productivity Programme] (PIP). This seeks to coordinate a number of policy measures which allow the Government to increase production and agricultural productivity, and in this way, to minimise the macroeconomic pressures deriving from the increase in food prices, which has been adversely affecting the Mozambican economy.

The PIP is based on the premise that food produced at low cost within national frontiers may improve the trade balance of a country. This premise makes sense for Mozambique, given its major dependency on imported food. In this context, the PIP is oriented towards the achievement of three major objectives in a short interval of time:

a) Increasing productivity and agricultural production in Mozambique, within a short time interval.
b) Guaranteeing the marketing of an additional flow of basic foodstuffs, directed towards the supply of centres of consumption within Mozambique.
c) Creating a commercial agricultural sector of significant size and with entrepreneurial characteristics, allowing it to insert itself efficiently into the commercial bank lending system in the future.

In order to ensure the success of the PIP, four critical elements must be overcome:

a) Local and district roads

Roads guarantee an outlet for production. In the absence of accessible roads, the productivity gains generated by agricultural modernisation are normally internalised by intermediaries, instead of by farmers. Speculating with the

distance and poor quality of roads, intermediaries pay less for the produce of peasants. Conversely, roads in good condition attract more traders and intermediaries, leading to a reduction in freight costs due to increased competition. By selling their output, farmers are in a position to negotiate with a larger number of traders and consequently, to secure better prices.

b) Warehousing and production processing infrastructure

Warehousing infrastructure in a rural environment, based on local traders, vans and small shopkeepers who operate rural shops and businesses, is in very poor condition and their means of transport are grossly inadequate. Efforts by the Government to guarantee credit for restoration or working capital for the purchase of goods have been weak. Producers have very limited access to markets, in some cases having to travel up to 15 km to reach the nearest commercial centre via roads which are impassable all year round.[24] This fact frequently causes the final product (maize, wheat, etc.) to be directed illegally to neighbouring countries, such as Malawi, Zimbabwe and Tanzania, instead of benefiting the Mozambican market. Another critical factor is associated with the processing of agricultural production, which is fundamental for adding value to the products and hence for increasing the income of the producer. There are few processing initiatives in Mozambique, with the available ones being limited, in the majority of cases, to the horizontally integrated chains of income generating products, such as cotton, sesame and tobacco.

***c)* Supply of seeds and fertilisers**

The availability of medium or high potency hybrid seeds and of chemical fertilisers is one of the most important conditions for the success of the PIP, given that the Green Revolution and the consequent increase in productivity are based on their intensive use. Within Mozambique, there are few companies which market hybrid seeds and fertilisers. The few in existence include Sementes de Moçambique (SEMOC), Associação de Produtores de Sementes de Lionde PANNAR, AGRIFOCUS, AGRIVET and TECAP. In general, seeds are produced by the informal sector, which does not guarantee quality or conditions for generating significant increases in productivity.

[24] Local traders generally have small government-licensed warehouses, capable of storing between 15-30 t of cereals. Normally, these traders operate through individuals who buy cereals for them invillages or at posts. These itinerant traders sell rapidly in order to empty their warehouses and buy more product.The so-called “Cantineiros” [small shopkeepers] are similar to local traders, but in general, have a more passive role and expect the peasants to bring their products to them. They warehouse slightly larger quantities, of 50-100 t. For their part, “cantineiros” accumulate inventories until the volume is sufficient to sell to large traders from abroad, such as PMA, DECA, Export Marketing, AbílioAntunes, V&M Grain Co.

***d)* Forms of access to credit which promote entrepreneurship**

As seen above, less than 3% of rural producers within the country receive rural credit. This credit is channelled via one of the following sources:[25]

- **Government,** through the **Fundo de DesenvolvimentoAgrário** [Agricultural Development Fund] (FDA) and the Fundo de Assistência a RecuperaçãoEconómica [Economic Recovery Assistance Fund] (FARE): These initiatives have limited resources and since they lack sufficient control and monitoring, have high *default* rates. On the other hand, they are subject to political constraints, which are sometimes incompatible with prudent and efficient management.
- **District Funds**: The value of these funds allocated to each district is small and does not meet existing demand for credit. In practice, weak control of payments causes this credit to be regarded as a donation. This situation is not sustainable in the long term and does not educate farmers to become normal customers for commercial credit.[26]
- **CEPAGRI** (Centro de Promoção da Agricultura) [Agricultural Promotion Centre]**:** Funds deriving from this institution, while useful, are, as a priority, directed towards entrepreneurial farmers, who represent a significant minority within Mozambican agriculture.
- **NGOs**: These institutions manage microcredit or rural credit systems, but are spread thinly and do not cover the whole of national territory, in addition to not offering standardised and homogeneous financing conditions for all producers.
- **Agroindustries**: These institutions have made seasonal credit available to producers integrated into the production chains of tobacco, cotton, sesame, etc., but supply is very limited relative to demand for credit. On the other hand, agroindustries are not interested in integrating cereal and food producers, due to the low level of loyalty of the latter.
- **Commercial banks**: since these do not have collateral guarantees from the producers (who cannot mortgage their lands), banks charge high interest rates (over 23% per year) and restrict credit to a very small number of producers who do not present a risk.[27]

As may be surmised from the previous paragraph, access to financial resources in a rural context is limited. One of the objectives of the PIP is to create a class of

[25]For more details on these funds, cf.**Annex 4**of this report.

[26]Cf.Stiglitz, J.E and Weiss A. 1981: "Credit Rationing in markets with imperfect information". American Economic Review, Vol. 71, N 3 June pp. 393-410.

[27]For a better understanding of the importance of Credit in Mozambique, cf.: Financing Mozambique, 2010, Swiss Capital Partners (SCP) Lda and FinantiaLda., Jane Grob and André Nogueira, Henrique Bettencourt, IónizeJonaze.

farmers of significant size, which will be able in the future to integrate into commercial and private banking circuits. In order for this to occur, it is essential to find formulas which guarantee that access to credit is not politicised or subject to patronage. In this way, it is intended that default risk should be as low as possible, avoiding the repeating of past errors. Using a commercial bank as an intermediary in the process appears to be an appropriate approach to follow.

At the same time, a rural finance policy also depends on the policies in fields such as infrastructure, markets, education and cultural aspects. Indeed, the farmer will have a higher probability of paying his debts if he has better access to consumer goods, without needing to go into debt in order to produce them. On the other hand, better education helps in understanding the difference between credit and donations, and hence, the importance of repaying a credit. Improved roads allow greater access to markets, increasing the income of farmers and hence their indebtedness capacity.

The PIP was sized precisely from the perspective of being a programme "integrated" with other sectors, so that it recommends the following activities: revitalisation of district roads, financing of the restoration of rural shops and warehouses, contractual arrangements with suppliers of inputs, assembly of a financial architecture with Commercial Banks in order to implement the programme, provision of a simple and non-bureaucratic rural insurance policy for hedging risk, formation of a Guarantee Fund against risk, to be financed by the State, focused and outsourced technical assistance, and lastly, seasonal credit which shall operate on the basis of the "intelligent" methodology of vouchersand mobile branches.

These activities were scheduled sequentially, so as to avoid bottlenecks during the implementation of the programme, with the structure illustrated below.

Restoration of local and/or district roads
Restoration of warehouses and means of transport
Agreement with input production companies
Contract with Commercial Banks
Harvest Credit Programme
Outsourced technical assistance
Agricultural insurance

We investigate each of the activities listed above in detail in the following section.

5.1 - Restoration of Local and District Roads

The PIP proposes the district and local roads should be levelled and/or built, with a view to connecting producers with the market. In the case of primary roads, the

data of the Economics Department of MINAG [28] demonstrate that in 2010, the state of that type of road and access to transport had improved relative to the previous year, above all in the Cuamba-Lichinga and Montepuez-Balama regions. In general, according to the source cited above, primary roads were accessible, even those with many problems, as is the case of the Milange-Gurué and Mocuba-Milange sections. The same is not true, however of tertiary and local roads. The current status of roads in Mozambique is presented in Table 4 below.

Table 4 - Status of roads in Mozambique

Type of Road	Primary (Km)		Secondary (Km)		Tertiary (Km)		Local (Km)	
Province	**Paved**	**Unpaved**	**Paved**	**Unpaved**	**Paved**	**Unpaved**	**Paved**	**Unpaved**
MAPUTO	322	0	50.5	120.5	90.6	477.4	22	513
GAZA	280	0	99	653	181	920	14	564
INHAMBANE	558	0	60	206	61	1.078	4	881
SOFALA	584	0	0	553	0	848	0	357
MANICA	513	0	0	336	0	960	0	633
TETE	540	0	287	942	0	788	0	413
ZAMBÉZIA	730	300	0	720	16	1,727	15	981
NAMPULA	559	448	0	181	22	1,987	0	864,7
CABO DELGADO	282	140	234	131	254	1,474	0	422
NIASSA	376	367	107	240	42	1,836	0	966
Total	**4,744**	**1,255**	**837.5**	**4,082.5**	**666.6**	**12,095.4**	**55**	**6,594.7**

Source: Information provided by the Directorate of Projects of the National Roads Administration (ANE),

As is noted in the above table, almost all of tertiary and local roads are unpaved. Their accessibility status appears to be highly precarious and requiring of urgent works, at least of levelling, in order to ensure that these roads are capable of supporting the increased traffic which will occur with growth in production and agricultural productivity.

District roads continue to be a major obstacle to marketing within the country, since they are not in a good state preservation. It was noted that in the North, Centre-East and Centre-West, district roads deteriorated from 2009 to 2010. Their restoration is fundamental, given that they are the links between agricultural production zones and district capitals, where centres of consumption are located.

[28] Bulletin of October 2010. Flash No. 55P.Results of the Investigations of SIMA - Department of Statistics and Department of Policy Analysis of MINAG - Economics Directorate – Statistical Department.

In order to reduce the constraints caused by the precarious condition of roads, the Ministry of Public Works and Housing (MOPH) could guarantee the accessibility of 2,000 km of local roads by March 2012, in the provinces of Manica, Cabo Delgado, Tete and Nampula, using funds from the DANIDA (Danish Cooperation) project. The MOPH could also restore bridges and engineering works on 36 km of strategic roads in the provinces of Nampula and Zambézia, using resources from the PROMER (Programa de Promoção de MercadosRurais) [Rural Markets Promotion Programme]. Roads not covered by the above projects may also benefit from levelling works to be financed by the Fundo de Estradas [Roads Fund], provided that they are strategic for connecting zones of agricultural potential. In order to identify the zones where roads urgently require restoration and/or levelling, MINAG has provided MOPH with a list of districts where the PIP will be concentrating its efforts.

Proposal: The MOPH is carrying out an up-to-date survey of roads and is guaranteeing their improvement, above all through levelling works, so that by 2012, roads will offer good conditions of accessibility and serve as an outlet for agricultural production.

5.2 – Restoration of Warehouses and Means of Transport

From a quantitative viewpoint, the situation of the agricultural commercial network in Mozambique is quite reasonable. As noted in the following table, wholesale, agents, retailers and service providers are spread thinly over the entire country in numbers more or less proportional to the consumption potential of each province.

Table 5 – Current domestic marketing structure

PROVINCE	1ST HALF OF 2011			
	WHOLESALER	RETAILER	SERVICES	TOTAL
NIASSA	130	594	68	789
CABO DELGADO	338	1,222	213	1,770
NAMPULA	1,174	3,023	464	4,642
ZAMBÉZIA	328	1,122	115	1,560
TETE	258	942	288	1,464
MANICA	294	1,041	246	1,573
SOFALA	717	1,858	525	3,069
INHAMBANE	280	1,325	274	1,848
GAZA	124	1,516	110	1,742
M. PROVINCE	1,516	3,335	767	5,550
M. CITY	8,262	9,745	4,428	22,091
TOTAL	**13,421**	**25,723**	**7,498**	**46,098**

Source: DNC/MIC. Licensing Map of Commercial Activity. July 2011. National Trade Department.

It is important to note that during the five-year period 1999–2003 alone, 3,309 commercial establishments of retail type and 3,106 of wholesale type were opened.

Rural warehouses and shops play an important role in boosting agricultural trade. Mozambique is no exception to this rule and while its available rural shops play an important role in boosting agricultural trade, Mozambique is no exception to this rule

and even if they have less storage capacity, they provide assistance by serving as an outlet for part of the production of the machambas. In 2011, 1,287 shops were in the process of being restored. The current status of shops within Mozambique is presented in quantitative terms in the following table.[29]

Table 6 - Current Status of Rural Shops (2011)

Provinces	Existing Shops			Shops under the management of the APIE		
	Total	Operational	Restored	Sold	For Sale	Total
NIASSA	189	140	39	77	42	119
CABO DELGADO	175	29	23	90	85	175
NAMPULA	1,480	387	424	611	321	932
ZAMBÉZIA	953	453	214	690	198	888
TETE	400	104	55	270	39	309
MANICA	158	93	61	219	95	314
SOFALA	496	337	94	111	191	302
INHAMBANE	836	308	79	192	30	222
GAZA	999	610	254	372	43	415
M. PROVINCE	395	101	44	265	29	294
TOTAL	**6,081**	**2,562**	**1,287**	**2,897**	**1,073**	**3,970**

Source: DNC/MIC. July 2011.

The situation is less satisfactory with regard to cantinas [very small shops]. Despite having been restored, many of them lack working capital to operate. Supporting their owners is important, since in the absence of buyers, farmers tend to sell the production in small quantities to itinerant traders, stalls or to less important shops.

In this way, given the importance of a functional agricultural trading network, it would be fundamental to channel credit to traders of agricultural products, in order to allow them to reinforce their marketing structures, guaranteeing a greater flow of goods for sale in urban centres. This is specifically a question of promoting the restoration and/or provision of cantinas, hangars, shops, warehouses and small vehicles in order to facilitate marketing and reduce post-harvest losses.

On average, restorations cost between US$ 4,000-16,000, depending on the type of commercial structure to be restored. For working capital, funds of around US$ 4,000 per cantina owner are required. Credit for such purposes is only currently available from NGOs, such as AMODER, in the North of the country.[30]

[29] In several debates, the idea has arisen of financing not only warehouses and shops but also granaries within machambas. In this way, an effort has been made to improve internal consumption (food security). The idea of the PIP is nevertheless precisely the opposite: that products should be rapidly marketed and marketedto urban centres.

[30] Financing traders has the additional advantage of diminishing the asymmetry of information between banks and customers. Local traders know villages better than lenders external to the community, for whom the cost of monitoring and punishing defaults is extremely high. In order to enter villages, financial institutions have to work with existing social structures, i.e. these latter entities may help banks to

The PIP recognises the advantages of agroindustrial integration in the process of boosting agroprocessing. For this reason, the PIP proposes to allocate US$ 5 million to continue supporting investments which promote agroindustrial integration. At the same time, it should be noted that many agricultural commodities are sold in the spot market, with prices set on a negotiated basis, as a function of supply and demand (e.g. exchanges). This type of product typically does not promote agroindustrial integration. Indeed, producers of beans or maize are unlikely to become reliable suppliers to companies, given the large quantity of buyers and the ever present possibility of securing better prices by bargaining with different ones.

For this reason, and considering that key products for the PIP are *commodities* (rice, maize, beans, wheat, potatoes, cabbages, onions and tomatoes), a careful study must be made of the scope for including them in agroprocessing systems. Agroprocessing must focus on rice growing regions, where the producers can obtain better prices if they supply rice which has already been polished. With small dehusking machines, significant price increases can be secured. Other value-adding activities, with cold processing, must concentrate on e.g. fruit, dairy products and cash crops. By allocating financing toagroprocessing companies, it is important to finance those which are able to enter into operation for the2011/2012 harvest.

Proposal:

- To encourage farmers to sell a greater proportion of their production, so as to increase the flow of agricultural products directed towards the supply of the domestic market.
- Finance local traders with credit subsidised by the Ministry of Trade and Industry.
    - **Target audience**: 3,000 retail and wholesale warehouses could be financed with an average value of US$ 5,000, equivalent to a total amount of US$15 million. This group will include processors of raw materials wishing to improve their structures or create new ones in timely fashion, in order to exploit the 2012 harvest.
    - **Credit lines**: 3 groups, with values of U$ 2,000, 4,000 and 6,000, depending on the dimensions of the trader.
    - **Conditions**: by way of consideration, in addition to paying credit, traders shall be required to assume the following commitments:
        a) Registering the purchase of production from a defined number of producers in each zone.

improve the profiles of possible borrowers. To achieve this, strengthening of traders has a double function: improving marketing and aiding the credit system to work more efficiently.

b) Directing the purchased product to the principal centres of consumption within the country, instead of sending it to neighbouring countries illegally.
c) Paying farmers a fair price.
d) Allowing shops/warehouses to be used before the planting of crops as a deposit for seeds and fertilisers of companies which shall supply producers of inputs.
e) As a guarantee of credit, traders shall pledge their assets which, in the event of default, shall be seized by the Government. In this case, the name of the trader shall be included in a list of individuals barred from access to credit in the future.

5.3 – Agreement with raw materials companies

One of the ways to increase agricultural productivity is to increase the levels of use of inputs such as hybrid seeds, fertilisers, pesticides, etc. There are currently several input companies in Mozambique, of which the largest ones are presented in Table 7 below.

Table 7 -List of companies supplying inputs in Mozambique:

Company	Headquarters	Specialisation
PANNAR	Maputo	Fertilisers
Afritool	Maputo	Miscellaneous inputs
Procampo	Maputo	Miscellaneous inputs
SEMOC	Maputo	Miscellaneous inputs
VETAGRO	Maputo	Veterinary products
MEDIMOC	Maputo	Veterinary products
Inácio de Sousa	Manhiça	Miscellaneous inputs
Hortimoc	Maputo,	Miscellaneous inputs
Agrivendas	Cuamba	Miscellaneous inputs
SECAMA	Quelimane	Miscellaneous inputs
Lúrio Emp.	Niassa	Miscellaneous inputs
AGRIVET	--	Miscellaneous inputs
TECAP	--	Miscellaneous inputs
AGRIFOCUS	--	Miscellaneous inputs

Forecasting that in the first harvest after the implementation of the PIP (2012/2013 season) there will be major demand for seeds, due to massive credit which, within the context of the PIP, shall be made available to farmers, it will be essential to create conditions to ensure that a significant number of seed producers (private agents) enter into operation, doing so in sufficient time before the planting season to produce seeds or to purchase them from other countries in quantities necessary for satisfying demand. The PIP recommends the use of medium potency hybrid seeds, which guarantee yields of at least 3,000 kg per hectare in the case of maize.

It is supposed that in principle, the market will react positively to the signal given by the Government in the announcement of its new Integrated Productivity Programme (PIP) and will make inputs available to those farmers considered as viable by the banking system and by the Government. At the same time, given the crucial importance of inputs for the success of the PIP and considering that seed producers may take some time to adjust to the greater demand driven by the proposed credit, the Government may be obliged to intervene, creating conditions and supporting the sector so as to guarantee that the seeds and fertilisers are in the shops during 2012, principally when planting begins.

Proposal:

- Both seed and fertiliser companies should be contacted in advance in order to determine their capacity for meeting demand for seeds and fertilisers, driven by the PIP and if confirmed, they shall become associates of the Commercial Banks so that they deliver the inputs to the farmer against the presentation of the *Voucher* by the same farmer.
- The additional offer of inputs may derive both from domestic sources and from imports to be executed by the companies mentioned above, but the companies may demand a working capital advance for this purpose. The Government may use part of the Guarantee Fund to be created to advance financial resources to companies, albeit while demanding that the companies reveal their financial situation, which must be well audited in order to avoid fraud.
- In addition, the Government may import inputs from other neighbouring countries and sell them to companies, which shall in turn deliver them to producers, against the presentation of vouchers.

5.4 – Contracts with the Banking System

In the event that the Government agrees to guarantee the risk of agricultural activity, it is highly probable that the Commercial Banks will have incentives to collaborate with agricultural credit. In order to do so, banks will have to be close to the principal centres of agricultural production, even if in the form of mobile branches. The current geographical distribution of banks and micro-banks in Mozambique is presented in Table 8 below.

Table 8 - Number and location of bank branches in Mozambique

Province	No. of Branches	% of Total	No. of Districts with Micro Banks	No. of Mobile Branches
City of MAPUTO	153	37%		
Province of MAPUTO	41	10%	7	10

GAZA	29	7%	6	12
INHAMBANE	28	7%	7	14
SOFALA	39	9%	6	13
MANICA	22	5%	5	10
TETE	25	6%	5	13
ZAMBÉZIA	21	5%	8	17
NAMPULA	38	9%	7	21
CABO-DELGADO	10	2%	4	17
NIASSA	10	2%	3	16
TOTAL	**416**	**100%**	**58**	**143**

Source: Bank of Mozambique, 2011.

It may be seen from the above table that there are micro-banks in 58 districts of the country, equivalent to almost half of the districts in Mozambique (128 districts). On the other hand, there are more mobile branches than the total number of districts. Notable among the banks included in Table 8 are Banco Terra (BT), PROCREDIT, BCI, MozaBanco, FNB Moçambique, BIM, Barclays, Standard Bank, SOCREMO, BancoTchuma. Some banks, such as Banco Terra (BT) and GAPI, are already operating normally with rural producers.

The branches of BT are in locations with agribusiness potential. Although it does not yet cover every province, the bank is in a rapid expansion phase and will shortly be launching a mobile banking service. Each of its branches has technicians who make field visits to provide support services to customers.

Other banks contacted, such as PROCREDIT, Barclays and BCI, have also expressed great interest in taking part in the PIP. It has thus been suggested that the programme should be operated with a set of commercial banks, dividing up the territory according to the areas which each bank covers or is in a position to cover.

The banks shall charge interest of 4% to viable family farmers (AFV), will retain 10% to cover their administrative expenses and shall have a Central Bank (BC) guarantee of 10% against possible defaults. 2% shall also be withheld by the AFV on stipulating the contract by way of rural insurance.

Proposal:

- The Ministry of Finance shall contact the banks in order to confirm their interest in operating rural credit and, if confirmed, to plan the financial architecture to be adopted during the implementation of the programme.
- Financial resources shall be passed by the Government to the banks, without interest or with token interest rates, in order to promote the circulation of credit.
- In return, the banks shall make their structure for selection, contracts, monitoring and collection of credits available to the PIP, with this to be extended in order to service the new customers of the PIP. This structure will have to be able to prevent defaults by farmers.

- In order to be accepted as partners of the PIP, banking institutions must provide the program with a system of mobile agents, capable of visiting machambas and concluding contracts on the ground with farmers. The technicians of the official extension network (allocated to the MINAG) shall identify these farmers in advance.

- The banks shall launch and disseminate the PIP, so as to prevent the politicisation of the credit mechanism, as tends to happen when the Government intervenes directly in the process.

5.5 – Seasonal Loans

The PIP shall provide rural credit to viable family farmers (AFV). Priority shall be given to the Centre and North regions of the country, where rainfall is more regular and permits rain-fed agriculture (cf. selection of regions in Appendix 1). In the South region, priority shall be given to servicing farming families who are currently practising irrigation, as these are lower risk. The 2012/2013, 2013/2014 and 2014/2015 harvests shall be financed through the Commercial Banks with the support of the Government. The products to be financed are: ***maize, rice, beans, wheat, potatoes, cabbages, tomatoes and onions.***[31]

Procedure for credit implementation:

- The Government shall guarantee default risk through a Fund financed by the Treasury specifically for this purpose, and subsidies (interest rate subsidies) by opening a line in the State Budget for the equalisation of the difference between market interest rates and those offered. In order to ensure understanding of the relevance, the need for and benefits of this subsidy, it shall be presented to society in a transparent way.

- If commercial banks do not have a default risk and since they shall ensure the circulation of significant quantities of funds, they will be able to agree on including their system of branches (present in half of the districts) and their systems of client selection, monitoring and control of payments. These banks know how to enforce the reimbursement of credits, despite the lack of collateral guarantees and of a payment culture within Mozambique.

[31] Another point linked to technology, which was discussed, refers to intercropping. It was found that in some areas, farmers develop their cropsusing intercropping, mixing an area of maize e.g. with sorghum or manioc.This is a rational and traditional practice of peasant agriculture which aims to minimise risk and guarantee the food security of the family. If farmers carrying out this practice are financed, however, the fertilisers applied to the land will be absorbed both by the maize, which is included in the programme, and by manioc, which is not, resulting in a negligible increase in maize yields. When evaluated, the programme will reveal itself to be incapable of increasing productivity as foreseen, since it will have been diluted over more than one product. It is thus suggested that the PIP finance and promote single-variety crops, with the spacing established pursuant to the technique of the Green Revolution and correct doses of fertiliser, according to the requirements of soils and of the hybrid seeds which shall be used.

- The state Fund, which shall guarantee loans, will only incur a loss in cases where default by producers is not covered by the insurance system, with this also proposed in this policy package[32]. It is estimated that 10% of total credit will be affected by defaults.

- Interest rates shall be 4% per year, at the cost of not encouraging producers in a satisfactory manner, who systematically witness the failure of their harvests, due to climate, wildlife and/or the low sale prices of their products.

- Banks shall receive remuneration for the administration of these resources, through the payment of an overhead of 10% of the value of the fund.

- The proposed credit system shall operate through VOUCHERS. The banks shall sign a credit contract with the Viable Family Farmers (AFV), with a reimbursement period of one year, but shall submit 4 VOUCHERS to them: one for fertilisers, one for seeds, one for pesticides and another for technical assistance. A small quantity of cash is foreseen as a payment for mechanisation (rental of machinery, animal traction or contracting of labour), which cannot be implemented through *vouchers*. Part of the interest shall be withheld by the bank at the time of releasing the credit.

- The bank shall also withhold an amount of 2% for agricultural insurance purposes, which shall be debited in the event of failure to repay the credit, due to unfavourable weather events during the harvest affecting the farmer's production.

- In this case, the credit must be allocated to the purchase of modern inputs, basically hybrid seeds, chemical fertilisers and pesticides, which shall be delivered by the associated input companies, through the presentation of the voucher which shall have been received beforehand from the Banks.

- The vouchers shall be nominal and non-transferable, so as to avoid misuse and illegal transactions involving them.

- If, at the end of the process, it is demonstrated that a producer has committed fraud, his assets shall be seized and he shall be included in a list of individuals prohibited from accessing the credit in the future.

- Commercial banks must select producers on the basis of previously defined criteria, which basically take into consideration whether the area of the planted machamba is equal to or greater than 4 hectares and less than 10 hectares. A declaration by the applicant, certified by the technician of the ServiçoDistrital de AtividadesEconómicas [District Service for Economic Activities] (DUAT), shall serve as a guarantee for the Banks that the beneficiary is compliant with the established criteria.

[32]It should be noted that all of the items proposed in this section are present in the PEDSA (p. 43).

- A MINAG technical team shall draw up a list of districts, containing the potential and maximum number of producers qualifying for financing on the basis of this criterion. This list shall be used by the Banks to monitor the release of financing, which shall not exceed the ceiling stated in the list for each district.

Characteristics of the Programme:

This consists of financing the use of a minimum technological package, within the context of the Green Revolution. The value to be financed shall be approximately U$ 1,000.00 per family, as may be observed below:[33]

Table 9 - Credit package for a plot of 4 hectares of planted area

Credit item	Value (U$)	Form
Fertilisers - 1 tonne*	620.00	VOUCHER
Hybrid seeds and pesticides	200.00	VOUCHER
Mechanisation and/or farming practices (labour)	100.00	Cash
Technical assistance	20.00	VOUCHER
Agricultural insurance	20.00	VOUCHER
Interest for 1 year (4%)	40.00	Withholding by the Bank
TOTAL	**1,000.00**	

An incentive is provided to apply one tonne of NPK, urea and medium potency hybrid seeds over an area of 4 hectares. The farmer will pay interest of 4% per year, which shall be discounted from the loan, together with a discount of 2% (U$ 20) of agricultural insurance and a discount of a further 2% (U$ 20) for technical assistance. The farmer will receive vouchers for U$ 820, in order to purchase the imports from associated companies, U$ 100 in cash for mechanisation and/or contracting of labour, and a US$20 voucher for technical assistance. The remaining U$ 60 shall be withheld by the Bank for the payment of interest and insurance.[34] It has been suggested that these

[33] Another issue which has raised doubts in some circles relates to the value of the package to be financed by agriculture. According to some technicians, the package offered, of around U$ 1,000, would be insufficient to cover all of the farmer's needs, making it inefficient for its purpose of increasing productivity.

This commentary derives from the idea that it is important to meet**all** of the farmers' needs. This is a case of operating with farmers who are already engaged in commercial activity and who thus already have their own resources, whether labour or capital. The target audience of the PIP is a rural middle class, which only needs a boost to reach higher levels of productivity. When "all" of the needs of the farmer are covered, his initiative is stifled. As was seen in Section 2, Hirshman (op. cit.) assumed thatdevelopment with scarce resources was the best way of promoting development. On the contrary, an excess of government actions may "suffocate" the population and cause it to "acquiesce" and thus lose the incentive to participate in a search for new solutions.This is what he termed "*development with disequilibrium*".

[34] A study of 2005, *Agricultural Input Trade Fairs and Vouchers in Mozambique:Experiences and lessons learned ICRISAT/ODI Working Paper Catherine Longley, Carlos Dominguez and MillyDevji September 2005,* shows that it is possible to operate a credit system through vouchers. Mozambique already has some experience in this form of

proportions should not be changed, as they are the minimum necessary for guaranteeing the productive effect of a "green revolution" in agriculture.[35]

Credit shall be directed on a priority basis to the Centre and North regions. In the South region, credit shall be restricted to farmers who currently practice irrigation. The remaining farmers are high risk as a function of the rainfall regime, which tends to limit their capacity to reimburse the borrowed resources.

It has been calculated that the increase in productivity generated by the greater availability of inputs will be 100% per year, raising production per machamba from the current 600 kg per hectare to approximately 2 tonnes per hectare within three years, i.e. 8 tonnes from 4 hectares of land. At current market value, this represents almost US$ 3,200, permitting farmers to repay the loan comfortably and to recapitalise themselves.

Target public:

The group of family farmers is divided into at least two subgroups: peasants or small, very poor farmers, who do not possess basic production factors and who thus do not respond to typical farming policies, such as price or credit policies, and entrepreneurial family farmers, who respond to market and credit signals.

Poor family farmers or peasants may nevertheless increase production by increasing area or improving management. These are forms which do not require government spending on research, credit or markets.

In Mozambique, an average of 1.5 ha per family is planted, while in Brazil, a family of peasants, without using technology and purely on the basis of sickles and hoes, i.e. with physical labour, cultivates an average of 4 ha. Increasing the area is a

process.The FAO operates in the provinces of Manica and Sofala with a system named ITF/voucher, which sought to guarantee that in practice, seeds reached the farmers and that the private sector which supplies seeds is also strengthened. Initially this operated as a pilot project (2001), but was then expanded on a national scale, above all for emergency situations. Since 2001, Vouchers have already been distributed to approximately 20,000 farmers per year. As may be seen, this is a form of providing benefits both to producers and to the seed market.

[35] Another topic linked to the package was the distribution of resources between the items to be financed. A proposal arose that the farmer should draw up a business plan and that, if viable, it should be financed.
While correct from a legal perspective, this prospect is risky for the following reasons:

a) Credit is currently distributed principally tofertilisers (62%) and seeds/pesticides (20%), with the remainder for contracting labour (10%), insurance (2%), technical assistance (2%) and interest (4%). The fertilisers and seeds component is given in vouchers, with only the labour component provided in cash. If a business plan were to consider the contracting of labour with more resources, e.g. 50%, due to this being considered appropriate, the seeds and fertilisers component would have to be reduced in the same proportion. Since the factors are not fungible, the reduction in chemical inputs or seeds would have a negative effect on the productivity impact, which logically would not be the same as had been hoped for with the use of the established correct dose.

b) If labour is increased within the business plan, a significant part of the credit would be given in cashinstead of vouchers as planned (since labour cannot be paid for in vouchers), greatly increasing the risk of misappropriation of resources and placing the financial sustainability of the programme at risk.

The PIP seeks to provide incentives for the Green Revolution, based on the use of high potency seeds, most of which are hybrid, and chemical fertilisers. Irrigation has also been used as a supplement in some countries. This aspect has been controversial, regarding the possibility of promoting the use of improved seeds within the country by companies or small producers, instead of importing hybrid seeds, but finally, a decision was reached in favour of hybrids.

possibility in Mozambique, although it entails overcoming some prior obstacles. As a point of departure, it is important to understand that the Mozambican peasant cultivates a limited area, probably because he faces one of the following problems:

1- Lack of physical strength due to hunger (food insecurity) or illness .[36]
2- Limits on the expansion of the area within the village due to natural, legal and/or political constraints.

If the problem is lack of physical strength due to food insecurity, the provision of credit to small, poorer farmers will probably lead to the use of these resources to finance consumption, which will not translate into increased production. Small farmers require support but arguably, credit is not the appropriate instrument. It is not common to lend money for peasants to spend it on food consumption, since this behaviour will not generate an income flow to pay the loan. In general, the problems of small farmers are better resolved through microcredit, as may be observed in detail in Appendix4.

On the other hand, even in the event that the small farmer allocates the credit to production, the productivity gains which may be generated in very small areas averaging 1.5 ha would not be sufficient to pay for the inputs used and the interest expenses, no matter how subsidised. Small farmers lack scale to undertake modernisation based on agricultural inputs and should thus remain in the sphere of organic production which, while less efficient, is low-cost and more accessible. As previously mentioned, improvement in production management (improvements in agricultural practices), is also a supplementary strategy for resolving the problems of the small farmer.[37]

Hence, the resolution of the problems of the small farmer require a social policy, rather than an agricultural policy, which must incorporate inclusive and structuring elements, such as education, food security, health, access to land, water, electricity, etc. At the same time, when the expansion of the area under cultivation is limited by legal aspects, it is essential to improve access to and security of land ownership through the registration and issuance of DUATs to a larger number of farmers.

In this way, the target public of the PIP must be composed of a group of viable family farmers (AFV), who are better capitalised, preferably young and who use modern technologies and possess a sufficiently large area to have a minimum scale of operation, who have guaranteed family physical labour available (i.e. individuals who

[36]Diseases are one of the major productive restrictions on the poorest. Malaria is the disease which causes the most deaths in Mozambique, according to a 2007 report by the InstitutoNacional de Estatística [National Institute of Statistics], and is the main cause for absenteeism within companies. One solution could derive from a centre for studies within Mozambique which is close to registering the first vaccine against malaria. Otherwise, protective nets for rural houses could be used to prevent the entry of mosquitoes, as was recently done in Kenya. The other extremely serious disease which restricts the strength the farmers is HIV/AIDS, which affects 17% of the population of Mozambique.

[37] Cf. Sitoe, T (2005): Family agriculture in Mozambique: sustainable development strategies.

are not going hungry) and who achieve a level of profitability compatible with the need to generate a return to repay the loan.

Farmers with this profile are more prepared to provide a rapid response to traditional agricultural policies which drive productivity increases through credit and access to markets.

A credit policy, which sought to serve the 3.7 million farmers in Mozambique, would not only be expensive but inefficient, as it would fragment resources among an entire group of producers which would provide a very limited return on the invested resources.

While less attractive from a political viewpoint, concentrating on the segment of viable farmers will be much more effective in terms of productive response. From a social perspective, it will promote a relatively decentralised agrarian structure, based on efficient small and medium-sized family operations, albeit without dismissing the role of communities and villages in retaining population in a rural environment until urban employment opportunities arise.[38]

The group of viable family farmers was identified by research on existing secondary data (TIA and Censos) at national, provincial and district level. Clustersof viable producers were also identified in the 11 provinces and 118 districts of Mozambique, as shown in the tables and maps of **Appendix 1**.

This target public of the PIP represents a number of farmers greater than the 21,693 farmers considered by the TIA as "average size". This category of the TIA only includes farmers with more than 10 hectares under cultivation, among other requirements. The proposal of the PIP expands the group to include those planting 4 hectares or more and/or who possess cattle and other animals, amounting to a total of 148,248 producers.

The focus on viable farmers with a minimum total area of 4 hectares, is supported in the known and relevant literature on Mozambique, such as:

1- The 1994 study, cited by Valá, Salim, carried out in the Chokwe zone, which concluded that 7.8 ha was the critical floor for a farmer to move from a subsistence agriculture system to a potentially profitable commercial system.

[38] During the elaboration of the programme, there were nevertheless doubts as to whether it was relevant to place a lower limit on the area required to become a beneficiary of the PIP. The proposal was to extend the scope to poor peasants, regardless of the area which they possessed. In addition to excessively expanding the public to be serviced and hence the budget, this expansion entailed working with peasants who preferentially dedicated their activities to internal consumption, which would not have significant macroeconomic effects.

2- A 2007 study[39], demonstrating that the change in productivity begins in a range of 3-4 hectares. This study estimates that expanding the area of those who have more than 5 hectares would have 3 times the impact on reducing poverty than expanding the area of those who have less than 1.75 hectares. This difference is explained by the greater capacity which medium-sized farmers have to generate employment and returns from agriculture relative to subsistence farmers.

3- Cungura (2008)[40] reveals that the machambas which overcome poverty have significantly more land than those below the minimum poverty thresholds. Only those with more than 4 hectares were able to emerge from poverty.

4- An IIAM study (2006)[41] shows that over the next 15-20 years, agricultural productivity will be contingent on the success of the manioc and maize programmes. These two food crops represent around 50% of production value and 55% of the potential for relieving income poverty in the family sector. The public with greater potential for reducing poverty through an increase in maize and manioc productivity consisted of: 3% of machambas with more than 5 hectares, i.e. 111,751 producers, of whom only 8% sell maize, 11% have animal traction, 3% use a tractor, 4% use fertilisers and 8% use pesticides.

5- Carrilho (2003)[42] also recommended that increasing the productivity and financial profitability of a significant portion of small farmers was the most appropriate way of escaping poverty and increasing food supply. "The poorest of the poor are always and everywhere the most difficult (expensive) to reach with innovative technologies and the direct effect of growth will frequently be concentrated in the third to a half of small farmers who are in a superior position" (p. 23). In this article, he proposed investment in research and extension to increase the productivity and profitability of agriculture in a

[39]Market Participation by Rural Households in a Low-Income Country: An Asset-Based Approach Applied to Mozambique,Duncan Boughton, David Mather, Christopher B. Barrett, RuiBenfica, DaniloAbdula, David Tschirley and BeneditoCunguara published in*Faith and Economics* Vol. 50, Fall 2007: 64-101.

[40]PATHWAYS OUT OF POVERTY IN RURAL MOZAMBIQUE. By Benedito Armando Cunguara A THESIS Submitted to Michigan State University in partial fulfillment of the requirements for the degree of MASTER OF SCIENCE, Department of Agricultural Food and Resource Economics 2008.

[41]INSTITUTO DE INVESTIGAÇÃO AGRÁRIA DEMOÇAMBIQUE [Institute of Agricultural Research of Mozambique]. Department of training, research and technology transfer. Estabelecimento de Prioridades para a Investigação Agrária no Sector Público em Moçambique Baseado nos Dados do Trabalho de Inquérito Agrícola (TIA) [Establishment of priorities for agricultural research in the public sector within Mozambique, based on TIA data]. T. Walker, R. Pitoro, A. Tomo, I. Sitoe, C. Salência, R. Mahanzule, C. Donovan and F. Mazuze, Research Report No. 3P, August 2006.

[42]Qual o Papel da Agricultura Familiar Comercial no Desenvolvimento Rural e Redução da Pobreza em Moçambique? [What is the role of commercial family agriculture in rural development and poverty reduction in Mozambique?]. JoãoCarrilho, RuiBenfica, David Tschirley and Duncan Boughton. Report No. 53P 14 of July 2003. MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT, Economics Directorate, Department of Policy Analysis.

significant part of the family farming sector and to concentrate investment in transport infrastructure in areas of major agricultural potential, linking the zones with zones of lower potential.

It is important to note that when the PIP concentrates on farmers who cultivate at least 4 hectares, it is selecting those who have already demonstrated the capacity to cultivate areas of this size, whether manually or using mechanisation, permitting the supposition that they may easily apply the technological package proposed in the PIP.

Except for the cultivation of vegetables, areas less than 4 hectares are not advisable, since they will be unable to repay loans, increasing the risk that the credit system proposed as a whole will lose efficiency and cease to be sustainable. Defaults may grow in significant fashion, leading to the bankruptcy of the rotating fund, which, in this way, would transform itself into a system of social protection, which is not the objective of the PIP.

It should also be noted that the Commercial Banks are not interested in operating with farmers who possess and plant very small areas. The banks currently operate with farmers with more than 10 hectares and according to information collected in interviews, would not agree to reduce this to less than 4 hectares.

On the basis of the microdata of the 2008 TIA, we note that the total number of producers possessing 4 or more hectares of land is 148,248, as is shown in Table 10 below.

Table 10 - Machambas of 4 ha or more as a share of total rural producers in Mozambique

Description	***At least 1 machamba ≥ 4 ha***
Number of farms	*148,248*
Declared area under ownership and cultivation	*14.3%*
Sale of cereals, groundnuts & beans	*35.3%*
Sale of manioc & sweet potatoes	*9.8%*
Cotton production	*13.1%*
Tobacco production	*35.9%*
Sesame production	*23.0%*

Source: preliminary MINAG elaboration on the basis of the microdata of the 2008 TIA.

While they do not possess the majority of the area (only 14.3%) and are a small proportion of the total number of machambas (3.9%), this group of viable family farmers (AFV) is responsible for a highly significant portion of total sold production, both of cereals and of tubers and cash crops, as is shown in the following table.

Table 11 - AFV share of total sales of cereals, tubers and cash crops

Range of area under cultivation	tonnes of cereals	% of total cereals*	% total tubers**	% total cash crops***
>0 ha - < 1 ha	25,152	8.2	20.2	6.3
≥1 ha - < 2 ha	69,105	22.5	44.6	18.7
≥2 ha - < 3 ha	51,094	16.6	13.3	23.3
≥3 ha - < 4 ha	48,693	15.8	9.9	19.9
≥4 ha - < 5 ha	30,198	9.8	4.0	13.5
≥5 ha - < 6 ha	36,379	11.8	2.8	9.4
≥6 ha	46,925	15.3	5.2	8.7
Total	**307,547**	**100**	**100**	**100**
≥4 ha	**113,503**	**36.9**	**12.0**	**31.7**

Source: 2008 TIA, MINAG
NB: *includes maize, rice, sorghum, pearl millet, groundnuts and beans, **includes potatoes and manioc, ***includes sesame, cotton, tobacco.

Farmers with 4 hectares or more account for 36.6% of total cereals, 12% of tubers and 31.7% of cash crops directed to the consumer market. They clearly constitute a group of emerging farmers oriented towards the market.

The remaining 3,579,000 farmers (who cultivate less than 4 hectares) are responsible, in entirely fragmented form, for the difference between sold production and internal consumption of their families. While receiving slightly more financing than small farmers, the AFV receive extremely small amounts of rural credit, as is noted in the following table:

Table 12 - Share of credit received by size category

Cultivated area (hectares)	Number of family farms receiving credit	% Credit/Total Credit	Number of family farms	% Credit/Number of family farms
0> - <1	18	11%	1,122	1.6%
≥1 - <2	38	23%	2,042	1.9%
≥2 - <3	43	26%	1,220	3.5%
≥3 - <4	21	13%	597	3.5%
≥4 - <5	12	7%	297	4.0%
≥5 - <6	9	5%	196	4.6%
>6	25	15%	313	8.0%
Total	**166**	**100%**	**5,787**	**2.9%**

≥4	46	28%	806	5.7%

Source: own elaboration on the basis of the microdata of the 2008 TIA

The subgroup of the AFVs, consisting of the 148,248 producers cited above, accounted for 28% of the credit granted in 2008, albeit within this subgroup, only 5.7% of the total received credit. This item of data reveals that funding is weak not only for the total group of farmers (only 2.9% had access to credit), but also for the subgroup of farmers with more than 4 hectares (only 5.7% of the total group of machambas had access to credit). In this way, access to credit within Mozambique is problematic for farmers of all sizes.

At the same time, the group of medium- and small-sized family farmers, which is currently responsible for 36.9% of sold production, is revealed as the only one with the response capacity to the stimulus to be provided by an agricultural policy based on credit and modern technology.[43] Major corporate farming operations are not considered within the PIP since they currently have access to formal credit markets at low interest rates, given the relative security which they provide to the banks, by comparison with small- and medium-sized farmers.

5.6 – Technical assistance

The technical assistance recommended by the PIP consists of disseminating technologies which already exist within the context of the so-called Green Revolution to the group of viable family farmers (identified in the previous section). For this purpose, a special system of ATER (technical assistance and rural extension) has been proposed, with this outsourced to NGOs or cooperatives of technicians, which would be selected to service the regions targeted by the PIP.

As previously explained, the credit programme includes a voucher for technical assistance. Together with his credit contract, the farmer will receive a voucher giving the right to 20 hours of individualised technical assistance. This voucher shall only be submitted to the technician on signing by the farmer, if the latter confirms that he has received assistance, and the technician will only receive his payments as the function of the vouchers collected in a satisfactory manner and signed by the producers.[44] The voucher mechanism will guarantee the empowerment of the farmer who in effect is the one paying for the technical assistance and who thus has the right to demand it.[45]

[43] A calculation which must be referenced with the in-depth research by Censos and the TIA.

[44] It has finally been proposed that technicians from the official network for technical assistance should be hired, and that these could in turn be beneficiaries of credit. This request must be evaluated by the MINAG, but it is suggested that before this, all of the alternatives should be exhausted in terms of seeking and recruiting young graduates from agricultural technical institutions for the purpose of providing the specific technical assistance which the PIP requires, and that credit should be negotiated preferentially with farmers rather than with public sector employees.

[45] Within Mozambique, there are a number of cooperatives of technicians who may be interested in taking part in the process. One of these is the *Associação de Técnicos Agro-pecuários*[Association of Agricultural Technicians] (ATAP).The Faculty of Agronomy and Forestry Engineering of Eduardo Mondlane University trains approximately

The contracting of technicians shall not be carried out by MINAG, which shall only select them, while the assistance services shall be paid for by the farmer according to information collected in interviews himself. The assistance work shall last for 3 months, with 3 visits during this period: one during the soil preparation and planting phase, one at the time of the first weeding and the last during the harvest phase. An average of 100 farmers shall be serviced by each technician. A technician who provides satisfactory services shall receive remuneration averaging US$ 2,000 (100 farmers at US$ 20 each), which will cover his meals, accommodation (in the event that he has to travel to another region) and salary.

5.7 – Agricultural Insurance

Within the context of the loan contract, the farmer shall be subject to a small withholding of 2% of the credit which he receives, in order to cover the price of a basic agricultural insurance policy, which shall be activated in cases of climate shocks, as well as droughts, infestations of pests or attacks by wildlife, which are detrimental to the harvest. In order to receive the value of the insurance, the farmer must submit the voucher and demonstrate that he has correctly applied the contracted agricultural package (fertilisers, pesticides, fungicides and herbicides) by showing the purchase receipts for these.

5.8 –Implementation of the PIP

The Programme shall be executed pursuant to the following timetable and budget:

Table 13 – Timetable

Year	Number of Producers
1st year - 2012/2013	45,000
2nd year - 2013/2014	50,000
3rd year - 2014/2015	55,000
Total	**150,000**

Table 14 -Total Budget of the PIP (Integrated Productivity Programme)

Item	Value in US$	Responsible Party
Rotating Fund*	150,000,000	Budget via the Central Bank
Overhead for Commercial Banks (10%)	15,000,000	Central Bank via Commercial Banks
Equalisation of interest rates (9.18%)	15,000,000	Central Bank, Budget
Default risk (10%, in addition to insurance cover for	15,000,000	Central Bank, Budget

60 agronomic engineers per year. TheTechnical and Professional School of Mabote [*Escola Técnica* e *Profissional de Mabote*] and other public and private institutions, such as the InstitutoAgrário de Boane and the InstitutoAgrário de Chimoio, train a considerable number of agricultural technicians every year, who might become involved in the process.

calamities)		
Credit for strengthening infrastructure for marketing and agroprocessing*.	15,000,000	Funds transferred to the MIC
TOTAL	**210,000,000**	

NB: *These values shall return to the public coffers every year.

As may be observed in the table above, the real cost of the PIP to the State coffers is US$ 60 million, since most of the allocated amount shall be on a rotating basis, i.e. it will be reimbursed by producers.[46]

The Government will charge the interest rate differential of 10%, which is the one between the interest charged to farmers (4%) and the 360-day interest rate of the Bank of Mozambique (BM), which in February 2011, stood at 13.18%. I.e., an interest equalisation line with a value of US$ 4.5 million should be introduced into the State Budget. In addition, the BM will pay the 10% overhead which the Commercial Bankscharge to provide credit, and would also assume a default risk of approximately a further 10%, for a value of US$ 4.5 million. This default fund will be debited in the case of uncollectable debts and/or climate catastrophes, in the event that the loss exceeds the value of the insurance policy (2%) contracted by the producers.

The amounts of the rotating guarantee fund will be transferred to Commercial Banks during the first year, without interest or with token interest rates, as a way of drawing its attention to the PIP. With these resources, the banks will accept the vouchers from the input companies and make the cash payment to farmers (US$ 100). The farmers would pay the banks the US$ 1,000 within at most one year and the funds would return in full to the Central Bank. Possible defaults will be debited from the fund especially created for this purpose (10%), but will not affect the rotating fund.

Loans for infrastructure would be channelled to shopkeepers and warehouses via the commercial banks, with subsidised interest rates and with a 3-year payment period.

The Ministries to be involved in the implementation of the Programme are listed in the following table.

[46] Since this is a new programme, it is possible that there will not be sufficient resources in the 2012 Budget. In the event that it is not possible to reallocate resources between areas of the government to give some space to this new programme (PIP), it is proposed that the Government issue debt securities which, on purchase by the same Commercial Banks, may be offset by a *crawling peg*: The government would collect funds from the banks with the issued securities and lend this resource to these banks without interest, in order to succeed in implementing the programme.

Table 15 - Ministries Involved in the Execution of the PIP

MINISTRY	FUNCTION IN THE PIP
MINISTRY OF AGRICULTURE	General coordination of the PIP, technical assistance, issuance of vouchers, associations with input companies, issuance of certificates of aptitude, monitoring and evaluation.
MINISTRY OF FINANCE	Provision of financial resources and contractual arrangements with commercial banks
MINISTRY OF TRADE AND INDUSTRY	Restoration of warehouses and shops
MINISTRY OF PLANNING AND DEVELOPMENT	Inter-ministerial coordination
MINISTRY OF PUBLIC WORKS	Restoration of roads

5.9 –Dissemination of the PIP

Since it is an integrated programme, the PIP requires effective institutional coordination. The institutional weaknesses existing in Mozambique may be offset by the broad participation of civil society, through its social, commercial and political organisations, which must evidently be involved in this process of expanding the production capacity of the country. It is also necessary to carry out a broad dissemination campaign for the programme on the basis of mobile technologies, radio, television, etc.

The offer of credit and details of the programme must be disseminated principally by the Commercial Banks, which shall lead the process, so as to avoid the politicisation and consequent deterioration of the image of the programme.

5.10 – Monitoring and Evaluation

The principal phases of the PIP are: contracting, planting, harvesting, marketing and repayment of loans. The monitoring of the programme must be carried out in each of these phases by specialised MINAG teams, in partnership with the district and provincial authorities.

The final evaluation of the results of the programme shall principally take account of the contribution which the PIP made to the national economy, in terms of additional flows of agricultural products (macro effect) and the empowerment which the beneficiary farmer received in terms of income generated (micro effect). For this purpose, the following indicators of results were drawn up:

Macro Effect:

A very preliminary estimate shows that with the PIP, it will be possible to triple current productivity and production within 5 years, using chemical fertilisers and medium potency hybrid seeds. The same result may be achieved in less time (3 years), using high potency seeds and a larger dose of fertilisers.

The conservative estimate shows that it would be possible to double current production of e.g. maize in the short-term, which would rise from 1.1 tonne/ha to 2 tonne/ha, still well below the international average.

The following table shows the expected impact of the PIP by product. The expected production of these products shall be carried out by 145,000 producers, located in the Centre and North zones of the country and in the irrigated perimeters of the South zone, which have favourable agro-climatic conditions.

Table 16 -Yields and Expected Production of 150,000 Farmers in the Programme

	YIELD (tonnes/ha)		PRODUCTION (tonnes/ha)	
CROPS	CURRENT	EXPECTED	CURRENT	EXPECTED
CEREALS				
Maize	1.2	3.0	2,178,842	5,447,105
Rice	1.1	3.0	271,402	690,866
LEGUMES				
Beans	0.5	1.0	263,771	617,149
VEGETABLES				
Onions	10.0	20.0	80,000	224,282
Tomatoes	14.0	25.0	195,000	611,628
Sweet potatoes	12.8	25.0	190,000	589,247

Source: SIMA System/MINAG Advance Notice

NB: The calculation of the impact on total production was made on the basis of the projected cumulative increase in productivity of the portion of production currently controlled by the 145,000 producers of the PIP (with over 4 hectares), representing 36% of total production.

Table 17 -Yields and Expected Production by Year

CROPS	YIELD (Tonnes/ha)			PRODUCTION (Tonnes/ha)		
	2012/13	2013/14	2014/15	2012/13	2013/14	2014/15
CEREALS						
Maize	2.0	2.5	3.0	3,486,147	4,505,845	5,447,105
Rice	2.0	2.5	3.0	449,047	573,620	690,866
LEGUMES						
Beans	0.7	0.8	1.0	396,712	498,452	617,149
VEGETABLES						
Onions	15	17	20	123,200	190,400	224,282
Tomatoes	17	20	25	280,243	523,878	611,628
Sweet potatoes	17	20	25	280,844	503,747	589,247

Source: SIMA System/MINAG Advance Notice

Micro Effect:

It is estimated that depending on the adopted scenario, the PIP could triple farmers' incomes in the short term, as is shown in the following table.

Table 18 - Micro Impact (at the level of the producer) of a 4 hectare package

Current income of 4 ha and projected income on the basis of the PIP in Meticais			
		Current	**Projected**
Scenario 1	2 ha of maize and 2 ha of rice	32,935	86,839
Scenario 2	2 ha of maize and 2 ha of beans	44,277	126,264
Scenario 3	2 ha of rice and 2 ha of beans	50,942	147,425

Source: SIMA MIC. No 838. 27/07/2011. The prices were MZN 31 for beans, MZN 9 for rice and MZN 5.4 for maize (1 kg). Productivity figures were extracted from the MINAG advance notice and were 1.1t/h for maize and 3t/h projected, 0.5/h for beans and 1.5t/h projected and 1.1/h for rice and 3t/h projected.
NB: Exchange rate of MZN 32.9/US$ 1.

The scenarios used in the above table suggest gross incomes ranging from MZN 86,839 per producer (model 1) to MZN 147,425 (model 3). The value of PIP financing,

which is MZN 32,900 (US$ 1,000)[47] shall be discounted from this value, with a net residual income for the producer of between MZN 53,000 and MZN 115,000 if planting is executed correctly and the climate helps.

If the farmer has an irrigation structure available, he may combine the above scenarios with some vegetable product, such a sweet potatoes or tomatoes. In this case, his income will increase significantly.

[47] Value estimated on the basis of the exchange rate (MZN/USD) in effect during the period of elaboration of this document.

6- FINAL CONSIDERATIONS AND PROSPECTS FOR THE FUTURE

The Integrated Productivity Programme (PIP) was drawn up, taking into consideration the natural fragilities of a low income country, as is the case of Mozambique, which has financial and management limitations that make it impossible to implement a more ambitious plan, such as the one contemplated in the NEPAD.

Among the typical instruments of agricultural policy, the PIP gives priority to those with a direct, short-term impact on agricultural productivity, namely seasonal credit, road and marketing infrastructure and agricultural insurance.

The PIP, developed by the IGC in coordination with the Mozambican authorities, nevertheless introduces some differences with regard to the traditional proposals of agricultural policy developed in Mozambique in the past. These principal differences are:

1- The State only assumes the Programme risk, not its implementation, which is the responsibility of the Banks. In this way, patronage and the politicisation of the programme is avoided.
2- The farmers have a rural insurance policy and hence minimise their risk.
3- The farmers have to repay the loans with no tolerance of fraud for unjustified defaults.
4- The input package includes modern technology and access to the same based on Vouchers to avoid misappropriations.
5- Technical assistance is outsourced and focused on increasing productivity.
6- The programme focuses on a specific segment of the overall population of farmers, namely viable commercial farmers cultivating more than 4 hectares of land.
7- The programme is integrated and conditional on a sequence of policies: warehousing, roads, inputs and bank branches.

Prospects for the Future

The PIP was approved by the Economic Council of the Office of the Prime Minister of Mozambique in July 2011. Its definitive approval by the Council of Ministers is still awaiting the identification of sources of funding.

For the implementation of the PIP, the Government of Mozambique introduced a technical team composed of technicians from the MINAG, MPD, MIC, MF and the MOPH, who finalised the official PIP document. Once the question of funding has been resolved, the PIP shall be forwarded to the Planning Committee, consisting of the Deputy Ministers of the MPD, MINAG, MIC and MOP, who shall submit it to the Council of Ministers for approval.

The funding of the PIP is being discussed within the MPD, MF and the Central Bank, which are seeking ways of reallocating some existing funds, such as the FARE,

FDA and those allocated to the PAPA. In the event that it is impossible to reallocate these funds, alternative sources of funding shall be sought (titles, donors, etc.).

There is also some chance that the implementation of the PIP shall begin for the 2012 harvest with irrigated crops, such as sweet potatoes, onions or tomatoes, which do not depend on rains and which hence may be funded throughout the year.

There is also a willingness within the Government to begin the implementation of the PIP with a pilot project, restricted to a number of regions or crops, in order to test the proposed methodology and create the conditions for a larger plan next year.

All in all, we believe that while the PIP has a rather complex architecture, if effectively implemented, it will be able to triple production and productivity in the selected agricultural zones within most three years. In order to achieve this, it must rely on sufficient human, institutional and social capital to guarantee its legitimisation by society and its efficient and rapid execution.

7- BIBLIOGRAPHY

ACEMOGLU, Daron;JOHNSON, Simon; ROBINSON, James. *Institutions as the Fundamental Cause of Long-Run Growth. CEPR Discussion Papers*. N. 4458, Berkeley, 2004

ADELEKE SALAMI, ABDUL B. KAMARA AND ZUZANA BRIXIOVA. *Smallholder Agriculture in East Africa: Trends, Constraints and Opportunities* Working Papers African Development Bank *Financing Agriculture and Access to Credit*

AGRA and FDCF's website, Africa Renewal (2009) and www.enterprisechallengefund.org /ecfund/ Uploadfile/EquityBank_CaseStudy(1).pdf

ANGELA KAGEYAMA. *Produtividade e Rendana Agricultura Familiar*: efeitos do PRONAF-crédito [Productivity and income in family agriculture: effects of PRONAF-crédito], IICA/MDA 2010.

ASSUNÇÃO, J.J, BRAIDO, L.H.B. *Testing Household-Specific Explanations for the Inverse Productivity Relationship.* Amer. J. Agr. Econ. 89(4) (November 2007): 980–990

BENEDITO ARMANDO CUNGUARA. *Pathways out of Poverty on Rural Mozambique.* THESIS Submitted to Michigan State University in partial fulfilment of the requirements for the degree of MASTER OF SCIENCE, Department of Agricultural Food and Resource Economics 2008.

BESLEY, TIMOTHY & PERSSON, TORSTEN (2011*).Pillars of Prosperity*. Princeton University Press.New Yersey. USA.

BOURDIEU, PIERRE. *O desencantamento do mundo*: estruturas econômicas e estruturas temporais. [The disenchantment of the world: economic structures and time structures], São Paulo: Perspectiva, 1979.

BUAINAIN, A.M. GUANZIROLI, C.E (1998). "Trajetória Recente das Política Agrícola Brasileira" [Recent Trajectory of Brazilian Agricultural Policy].FAO/INCRA Project.UTF/BRA/036/BRA. Brasília.DF.

CADAAP Comprehensive African Agriculture Development Programme (*CADAAP*), website visited on 2/11/2011: http://www.nepad-caadp.net/

CAMBAZA VIRGILIO. 2000 "*A Lei de Terras, de Minas e Sistemas de Direitos Consuetudinários"* [The law of lands, mines and systems of customary rights], Conference Paper 12.Instituto de Estudos Sociais e Econômicos [Institute of Social and Economic Studies],2nd IESE Conference**.**

CARRILHO, JOÃO, RUI BENFICA, DAVID TSCHIRLEY AND DUNCAN BOUGHTON.Qual o Papel da Agricultura Familiar Comercial no Desenvolvimento Rural e Redução da Pobreza em Moçambique? [What is the role of commercial family agriculture in rural development and poverty reduction in Mozambique?]. Report No. 53P, 14 July 2003, MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT, Economics Directorate, Department of Policy Analysis.

CASTELAR, A. P. (2005). *Direito, Economia e Mercados* [Law, Economy and markets], Editora Campus

COLLIER.P. (2008).“The Bottom Billion”.Oxford University Press. London. UK.

DESAI, B. M.; GUPTA, V. K.; SINGH, Gurdev. *Institutional Credit for Green Revolution and Dry-Farming Areas in India;* Indian Institute of Management, Ahmedabad, 1987.

DfID (2002).*Better livelihoods for poor people: the role of Land Policy, discussion* draftby Julian Quan, Apr 2002.

DUNCAN BOUGHTON, DAVID MATHER, CHRISTOPHER B. BARRETT, RUI BENFICA, DANILO ABDULA, DAVID TSCHIRLEY AND BENEDITO CUNGUARA. *Market Participation by Rural Households in a Low-Income Country: an Asset-Based Approach applied to Mozambique*, published in *Faith and Economics*, Vol. 50, Fall 2007: 64-101.

FAO (1996).*Rural Credit markets and the effectiveness of policy reforms*. Social and Economic Paper 134.

FAO STAT 2008, Food and Agriculture Organization of the United Nations. Site visited on 2/11/2011.

FENGXIA DONG, JING LU, AND ALLEN M. FEATHERS. *Effects of Credit Constraints on Productivity and Rural Household Income in China* Paper 10-WP 516 October 2010,Center for Agricultural and Rural Development. Iowa State University

FREEDOM FROM HUNGER. (2003). *Demonstrating Impact with SROI Modelling*, Concept Note, 2p

FÜRSTENAU, Vivian. *A política de crédito rural na economia brasileira pós 1960* [Rural credit policy in the Brazilian economy after 1960]; Ensaios FEE, Porto Alegre, 1987

GASQUES; J. G.; BASTOS, E. T.; BACCHI M. P. *Produtividade e Fontes De Crescimento Da Agricultura* [Productivity and sources of growth in agriculture]*;* IPEA, 2010

GERARD VAN EMPEL. *Rural Banking in Africa: The Rabobank Approach*, FOR FOOD, AGRICULTURE, AND THE ENVIRONMENT Focus 18 • Brief 4 • July 2010

GUANZIROLI, C.E (2010). "*Agronegocio y Agricultura Familiar En Brasil: Políticas Agrícolas y Agrarias Que Dieron Suporte En Los Últimos Treinta Años"* [Agribusiness and family agriculture in Brazil: agricultural and agrarian policies which provided support over the last 30 years]. CIDE Conference, 10/11 November 2010, Auditorio Cuajimalpa *México D.F*

GUIRKINGER, Catherine; BOUCHER, Steve. *Credit Constraints and Productivity in Peruvian Agriculture*; Department of Agricultural and Resource Economics University of California, Davis; Working Paper No. 07-005; 2007

HANLON JOSEPH, (2002).Debate sobre a Terra em Moçambique: Irá o desenvolvimento rural sermovido pelos investidores estrangeiros, pela elite urbana, pelos camponeses mais avançados ou pelos agricultores familiares? [Debate on land in Mozambique: will rural development be driven by foreign investors, by the urban elite, by more advanced peasants or by family farmers?], *investigative study commissioned by Oxfam GB - Regional Management Centre for Southern Africa* (www.oxfam.org.uk), 12 July 2002 .

HÉLDER R. GÊMO. Moving towards the Implementation of the CAADP Framework in the Agriculture Sector: The case of Mozambique. February, 2011

HENRY, C. SHARMA, CECILE LAPENU, MANFRED ZELLER. (2003). *Micro Finance Poverty. Assessment Tool, Technical Tools.* Series nr 5, CGAP, the World Bank, Washington, 206 pp.

HIRSCHMAN, A. (1961). *Estratégia de Desenvolvimento Econômico* [Economic Development Strategy], Fundo de Cultura; Rio de Janeiro; 1961

IIAM (2006) INSTITUTO DE INVESTIGAÇÃO AGRÁRIA DE MOÇAMBIQUE [INSTITUTE OF AGRARIAN RESEARCH OF MOZAMBIQUE]. *Relatório de Pesquisa República de Moçambique Estabelecimento de Prioridades para a Investigação Agrária no Sector Público em Moçambique Baseadonos Dados do Trabalho de Inquérito Agrícola (TIA)* [Research report of the Republic of Mozambique: establishment of priorities for agrarian research in the public sector in Mozambique based on data of the agricultural survey (TIA)], by T. Walker, R. Pitoro, A. Tomo, I. Sitoe, C. Salência, R. Mahanzule, C. Donovan & F. Mazuze, Research Report No. 3P, August 2006.

IFAD (International Fund for Development Assistance). 2004. *Country Strategic Opportunities Paper* (COSOP).

IFPRI. 2010 Discussion Paper No. 114, International Food Policy Research Institute, Washington D.C., 35.

IFPRI. 2010*Transforming African Economies* - Factsheet on Mozambique

IFPRI. The Rabobank Approach, *Gerard van Empel,* for Food, Agriculture and the Environment Focus 18 • Brief 4 • July 2010

IFPRI.2011*Increasing Agricultural Productivity Critical to Food Security in Sub-Saharan Africa*, Nov 1.

INE (Instituto Nacional de Estatística) [National Statistical Institute]. (2003). *Trabalho de Inquérito Agrícola* [Agricultural Survey] (TIA).

IRAM (Institute de Recherche et d´Application des Méthodes de Développement), 2003.*Study Design of a Rural Finance Scheme for Cabo Delgado and Niassa Provinces Rural finance options for promoting effective agricultural commercialization in the Pama focal areas of Northern Mozambique*.

JANE GROB AND ANDRÉ NOGUEIRA HENRIQUE BETTENCOURT, IÓNIZE JONAZE. Financing Mozambique, 2010, Swiss Capital Partners (SCP) Lda. and FinantiaLda.

JANVRY, A.; MCINTOSH, C.; SADOULET, E.; *The supply and demand side impacts of credit market information*; 2006

JONATHAN CAMPAIGNE AND TOM RAUSCH *Finance Bundling Development Services with Agricultural Finance: The Experience of Drum Net for Food, Agriculture*, *and the Environment Focus*, 18 • Brief 14 • July 2010

JORGENSON, R.;*Armadilhado Desenvolvimento* [The Development Trap], Awarwala, op. cit.

LAPENU, C. & MANFRED ZELLER.(2001). *Distribution, Growth, and Performance of the Microfinance Institutions in Africa, Asia and Latin America. A Recent Inventory,* Journal of Development and Agricultural Economics Vol. 3(2), pp. 35-47, February 2011 Available online at http://www.academicjournals.org/JDAE ISSN 2006- 9774 ©2011 Academic Journals Full Length Research Paper

LEDGERWOOD, J. (1999). *Microfinance Handbook: An Institutional and Financial Perspective,* World Bank, Washington D.C.: World Bank, Sustainable Banking with the Poor Project.

LEWIS ,W.A.; "*Desenvolvimento Econômico com Oferta Ilimitada de Mão de Obra*" [Economic development with an unlimited supply of labour]; Johns Hopkins, 1954

LUCAS, R.E. Jr.*On the mechanics of economic development*.J ournal of Monetary Economics, v. 22, n.1, p. 3-42, 1988.

MAGALHÃES André Matos, et al (2005): *"The family farm programme in Brazil: the case of Parana"***.** XVIIISOBER Congress, July 2005. Ribeirão Preto, SP.

MAGALHÃES André Matos, et al (2005):",*The family farm programme in Brazil: the case of Pernambuco".* XVIIISOBER Congress, July 2005. RibeirãoPreto, SP.

M.J MOLOI 2010.A Comparison of Socioeconomic Characteristics that Determine the Farm Income of Emerging Livestock and Horticultural Farmers in South Africa.A Comparison of Socioeconomic Character.

M.S. SRIRAM *Productivity of Rural Credit: A Review of Issues and Some Recent Literature* W.P. No.2007-06-01 June 2007, THE INDIAN INSTITUTE OF MANAGEMENT, AHMEDABAD, INDIA

MARTINA WIEDMAIER-PFISTERAND BRIGITTE KLEIN. *Microinsurance Innovations in Rural Finance for Food, Agriculture and the Environment*. Focus 18 • Brief12 • July 2010.

MATUS, C, *Planejamento Estratégico*[Strategic planning]; IPEA; Economics Ministry, Brazil; 1993

MINAG 2011.PEDSA. Plano Estratégicopara o Desenvolvimento do Setor Agrário [Strategic Plan for the Development of the Agrarian Sector], Mozambique. 2011-2020.

MINISTÉRIO DA AGRICULTURA [Ministry of Agriculture], 2006, Conceito, Princípios e Estratégia de Revolução Verde em Moçambique [Concepts, Principles and Strategy of the Green Revolution in Mozambique].

MINAG (2006), Economics Directorate, "*Sobre o Papel do Governo no Mercado de AlimentosBásicos: Panorama Baseado em Pesquisa Recente e Implicações para Moçambique*" [On the role of the government in the market for basic foods: overview based on recent research and implications for Mozambique], Emílio Tostão and David Tschirley.

NORTH, D.C (1990): Institutions, Institutional Change and Economic Performance. Cambridge University Press.

_____ (1993): The New Institutional Economics and Development, Washington University.

_____ (1981): *Structure and Change in Economic History*. New York: Norton.

NURKSE, R: *Algunsas pectosinternacionais do desenvolvimento economico* [Some international aspects of economic development]. In Agarwala. "Teorias do desenvolvimento Econômico" [Theories of economic development]. John Hopkins, 1967

OLSON, M. (1996): *Big Bills Left on The Sidewalk: Why Some Nations are Rich and Others Poor, Distinguished Lecture on Economics in Government*. *Journal of Economic Perspectives,* v. 10, n. 2, spring 96, pp. 3-22.

PINSTRUP-ANDERSON, P. 1993. Unpublished testimonies presented to the United States House of Representative, Committee on Agriculture, Sub-committee on Foreign Agriculture and Hunger, in International Food Policy Research, Washington D.C.

RAGENDRA DE SOUSA. *Reflections on Rural Development Strategy in Mozambique* Ph.D. Cornell University. 2003.

RAMUKUMBA , J. A. GROENEWALD, H. D. VAN SCHALKWYK , M. B. GUNDIDZA & A. N. MAIWASHE CARTER R, VAN AH (2006). *Small firm bankruptcy.* J. of Small Bus. Man., 44(4): 493-512.

ROMER, Paul M. *Increasing returns and long run growth.* Journal of Political Economy, 94, p. 1002-1037, Oct. 1986.

ROMER, Paul M. *Human capital and growth: theory and evidence*. Carnegie-Rochester Conference series on Public Policy, North Holland, 32:251-286, 1989.

ROSTOW, W.A.; "*As etapas do Desenvolvimento Econômico*" [The stages of economic development]; Zahar Editora; 1978

SACCO DOS ANJOS, Flavio (FECAMP) et al. (2004):*Agricultura familiar e políticas públicas: o impacto do PRONAF no Rio Grande do Sul*. [Family agriculture and public policies: the impact ofPRONAF in Rio Grande do Sul], XVII SOBER Congress, July 2004. Cuiabá, MT.

SEN, Amartya; *"Desenvolvimento Como Liberdade*" [Development as freedom]; Companhia das Letras; Brasília; 2001.

SIMON, PAUL DE WIT (2010). *Reconhecer Direitos sobre os Recursos Naturais em Moçambique* [Acknowledging rights over natural resources in Mozambique], working document for Rights and Resources Initiative. January 2010.

SIRIAM, M.S.; *Productivity of Rural Credit: A Review of Issues and Some Recent Literature*; The Indian Institute of Management, Ahmedabad, 2007

SITOE, T (2005): Agricultura Familiar em Moçambique: estratégias de desenvolvimento sustentável [Family agriculture in Mozambique: sustainable development strategies].

SPOLADOR, Humberto F. S; BARROS, Geraldo C.; *Produtividade Agrícola e Preço da Terra no Brasil – Uma Análise Estadual* [Agricultural productivity and land prices in Brazil: an analysis by state]*;* ESALQ/USP; Piracicaba; SOBER; Campo Grande; 2010

STIGLITZ, J.E AND WEISS A (1981).*Credit Rationing in markets with imperfect information*.American Economic Review, Vol. 71, No. 3, June, pp. 393-410.

SOUZA FILHO HILDO MEIRELLES, BUAINAIN ANTÔNIO MÁRCIO, GUANZIROLI CARLOS (2005) *Agricultura Familiar e Tecnologia no Brasil: características, desafios e obstáculos*[Family agriculture and technology in Brazil: characteristics, challenges the obstacles]. SOBER Congress, Porto Alegre. Brasil

V. M. MMBENGWA * T. *Factors that influence the success and failure of land bank supported farming small, micro and medium enterprises (SMMES) in South Africa* .

WALKER, R. PITORO, A. TOMO, I. SITOE, C. SALÊNCIA, R. MAHANZULE, C. DONOVAN E F. MAZUZE.INSTITUTE OF AGRARIAN RESEARCH OF MOZAMBIQUE. Training directorate, *Documentação e Transferência de Tecnologias. Estabelecimento de Prioridades paraa Investigação Agrária no Sector Público em Moçambique Baseadonos Dados do Trabalho de Inquérito Agrícola* (TIA) [Documentation and transfer of technologies. Establishment of priorities for agrarian research in the public sector within Mozambique, based on data from the TIA]. By T. Research Report No. 3P, August 2006.

WILLIAMSON, O. (1985).*The Economic Institutions of Capitalism*, 1985.The Free Press.Collier Macmillan. London.

YARON, W.B. (1995). *Rural Finance in Developing Countries.*

APPENDIX 5

COMPARISON BETWEEN THE INTEGRATED PRODUCTIVITY PROGRAMME (PIP) OF MOZAMBIQUE AND THE AGRICULTURAL INPUTS PROGRAMME OF MALAWI (FISP)

The experience of Malawi, described below (cf. Box), demonstrates that a programme based on modern technologies (fertilisers and hybrid seeds) contributed to the tripling of national productivity and production within a short interval (2006 to 2009), also allowing the country to escape from dependency on imported products, to export some surplus, to reduce rural poverty and to improve macroeconomic variables (GDP and Inflation).

The PIP of Mozambique resembles the FISP of Malawi in its opting for Green Revolution technologies (fertilisers and hybrid seeds) and its use of Vouchers instead of money, for the producer credit component.

Unlike the Malawi programme (FISP), the programme for Mozambique (PIP) focuses on a specific segment of 145,000 commercial producers, capable of producing large volumes and of having a more efficient impact on production as a function of their proven experience in agriculture. The Malawi Programme had as its focus the poor rural population as a whole, entailing a public to be serviced of approximately 1,500,000 producers.

For this reason, the cost/benefit ratio of the PIP of Mozambique is greatly superior to that of Malawi. In Malawi, around US$ 248 million per year are required to maintain national maize production at its current level, i.e. 2 million tonnes, above the level of 1 million tonnes of maize which it had previously had. In Mozambique, the PIP, with a cost of US$ 45 million, may increase production by 1.2 million tonnes of cereals. Cf. the table below.

Table 1 – Cost-Benefit Ratio of Compared Programmes

	Production prior to the programme	No. of producers benefiting	Annual cost of the programme	Increase in production	Cost/benefit	Value applied per producer
	Tonnes	No.	US$	Tonnes	US$/Tonne	US$/No.
Malawi-FISP	1,225,000	1,500,000	248,000,000	2,000,000	124.0	165
Mozambique-PIP	1,700,000	145,000	45,000,000 *	1,200,000	37.5	333

*NB: The total PIP budget would be US$ 210 million, but a considerable part of this value is reimbursable. The value of US$ 45 million covers the part of the overhead which is retained by the banks, the equalisation of interest rates and the default fund. The default fund guarantees that the reimbursable part is de facto recoverable.

The Malawi programme costs US$ 124 for each additional tonne produced, while the Mozambique programme will cost US$ 37.50 per tonne produced, i.e. little more than a quarter of the price. This is hence a programme which, by focusing on a smaller but more productive target, will boost resources much more effectively.

In Malawi, a massive donation of fertilisers and seeds (the voucher payment is symbolic) is made to a very large number of poor producers, while in Mozambique, a reimbursable credit will be given to a small number of emerging producers (145,000), who in the future may integrate positively into credit markets and into factor markets in general. Against this, in Malawi, donations will have to be continued permanently in order to maintain the achieved production levels.

On the contrary, Mozambique is seeking to create entrepreneurial spirit, which is not achieved through donations. The FISP costs the state coffers of Malawi US$ 248 million per year, while the PIP of Mozambique, if concentrated into one year, would cost US$ 45 million and if into 3 years, US$ 15 million per year, with this not being subsequently repeated, since it is estimated that these farmers would enter the normal banking circuit, whereas since the Malawi programme is a donation, its farmers would always have to be serviced.

The Malawi programme is restricted to the provision of agricultural imports, while the Mozambique PIP includes actions for improving roads, restoring warehouses, cantinas and agroindustries, technical assistance and rural insurance in a programme which serves producers through a network of input suppliers and commercial banks. It is thus an integrated programme of systemic type, and not merely production-driven like the one in Malawi.

The Malawi Programme is restricted to 2 products, maize and tobacco, while the PIP of Mozambique intends to finance a much larger number of crops, such as maize, rice, beans, potatoes, onions and tomatoes.

In order to implement a programme servicing 1,500,000 producers in Mozambique, a network of operators and major logistics would be necessary. This will not be necessary in a programme such as the PIP, which concentrates on a smaller group of spatially localised producers. It should be noted that these producers, with more than 4 ha, are now in a position to produce with modern technology. This is proven with the data of the 2008 TIA, which reveal that in that year, the group produced 35% of the total agricultural output of the country.

Similar programmes to Malawi have already been implemented in Mozambique, albeit on a smaller scale and with donations of native or improved seeds instead of hybrids, although these had a residual impact on increases in the agricultural productivity of the country.

Box 3 - Malawi Rural Credit Programme: Farm Input Subsidy Programme (FISP)

Starting date	Began in 2005 and supported the 2005/6 annual harvest, continuing until 2010/2011.
Number of customers serviced	1,500,000 farmers per year, equivalent to 50% of total domestic farmers.
Size	Less than 1 hectare of arable land.
Form	Voucher for fertilisers, seeds and pesticides
Quantity	A 50 kg sack of NPK, a 50 kg sack of urea and 10 kg of hybrid seeds
Process	a) Traditional chiefs assist with the identification of potential beneficiaries of the project, being guided by the terms of reference of the project; b) The extensionist verifies the eligibility of the candidates selected by the traditional leader; c) Having confirmed the eligibility, the vouchers are then distributed among the selected candidates; d) Once the farmer has the voucher, he may use it or exchange it in various private shops and at some associations of farmers accredited by the State to receive the vouchers. Among these, ADMARC, a government institution, appears as the major distributor, since it has a broader infrastructure base spread throughout the country; the beneficiaries are sometimes identified using biometric techniques, such as retina scans, fingerprints or facial identification, which has significantly increased the efficiency of the programme.
Focus criteria	a) Being a Malawian citizen and owning and planting a plot of land. b) Being a resident of a settlement or village. c) Only one beneficiary per household may be registered d) Priority for poor or vulnerable individuals.
Products financed	**Maize and tobacco.**
Quantity of inputs used	Approximately 200,000 tonnes of fertilisers and 5,000 tonnes of hybrid seeds per year are delivered.
Value payable	The farmer pays a value equal to 25% of the effective value of the input purchased by the government via the voucher. The cost to the government averages US$ 150 million per year, equivalent to an average value of US$ 100 per beneficiary, including all of the logistics and other costs of the programme.
Source of financial resources	This programme is financed by the Government budget. Some international organisations have joined to subsidise certain costs relating to the logistics of the programme, such as DFID, USAID, WB, NORAD. In 2008/9, it cost US$ 285 million, of which donors contributed US$37.8 million farmers paid US$ 43 million, i.e. less than 20%. In 2008/9, this represented 16.2% of the national budget and 6.6% of national GDP. These values increased as a function of the increase in the price of fertilisers. In previous years the figures were around 8% of the budget and 3% of GDP.
Purchase of inputs	The Government purchases the fertilisers, pesticides and seeds in Saudi Arabia, India, Malaysia, Singapore and other countries.
Reimbursement	The State purchases the package of fertilisers, pesticides and seeds in the international market. Companies merely play the role of distributor among the holders of the voucher. In this process, distributors only earn preset commissions with a token value, which the farmer pays when he collects the fertilisers, pesticides and seeds. This value is approximately US$100. The Government does not use banks in this project.
Impact of the programme	a) Production of maize rose from 1.2 million tonnes in 2005 to 2.7 million tonnes in 2006, 3.4 million tonnes in 2007 and 3.8 million tonnes in 2008/9. This figure more than tripled in 3 years (2006 to 2009). b) The use of fertilisers rose from 90,000 tonnes in 2005 to 190,000 tonnes in 2008/9, while the use of hybrid seeds rose from less than 100 tonnes to 4,532 tonnes in 2008/9. c) Maize exports increased by 100,000 tonnes per year. d) The percentage of individuals below the poverty level fell from 54.1% to 52.4% between 1999 and 2005, but between 2006 and 2009, it fell from 52.4% to 39.5%. Individuals are consuming more calories and protein by virtue of the increase in maize production. e) Gross product, which grew by only 3.5% in 2005, grew at rates of 6.7%, 8.6%, 9.7% and 6.9% per year from 2006 to 2009. Inflation decreased from 15.4% in 2005 to 10.1% in

	2009, while the deficit to GDP ratio remained constant at around 2% per year, with increases only in 2009 as a function of the increase in fertiliser prices.
Assessment of beneficiaries	2/3 of beneficiaries said that the effect was positive in terms of food security, 27% said that they increased their investments, 30% improved their consumption, 40% the health of their children and 65% improved school attendance.
Weak points	Alleged commercial misuse, meaning that individuals who would normally buy fertilisers stopped doing so as a function of the subsidy, with this being equivalent to approximately 30% of sales of inputs. There was allegedly also corruption, due to the existence of secondary markets for imports which had allegedly been sold at low prices by some beneficiaries. There were deficiencies in transport and warehousing systems, which are being considered in the current programmes. .
Notable events	The President of Malawi, BinguwaMutharika received the inaugural prize from the Rede de AnálisesPolíticassobreAlimentos, Agricultura e RecursosNaturais [Network of Policy Analyses on Food, Agriculture and Natural Resources] (FANPRAN) for his agricultural policy interventions, which transformed Malawi from a country with food deficits into a net exporter of maize. The prize is intended to encourage the countries of the region to be self-sufficient in food production. Other countries such as Kenya, Tanzania and Nigeria have followed Malawi's example.
Support by DFID	More recently, the Government inaugurated a more wide ranging programme, named the Agriculture Sector Wide Approach (ASWAp).
Other programmes in Malawi	**Rural credit to medium-size progressive farmers**. As a credit programme, it only finances farmers which are members of some association of farmers with 2-10 hectares. Essentially, the credit is issued through a voucher which is intended to provide fertilisers, irrigation tools (e.g. motor pump), pesticides, seeds, etc. To farmers with a greater capacity for responding to the market. This credit varies from US$ 500-US$ 5,000 per farmer, depending on the need for each candidate and confirmation by the association as an integral part of the same. This credit is channelled through commercial banks, with the participation of agricultural traders, such as: Agora, ADMAC, Farmers Weld, Export Trading , etc. The interest rate applied to this programme is 15%, against the 25% normally charged by banks.

Box 4 - Integrated Productivity Programme (PIP): Mozambique

Start	If approved and included as part of the PEDSA, it should start in 2012
Number of producers to be serviced	145,000 farmers over 3 years (2012 to 2015).
Size	Farmers with machambas of 4-10 hectares.
Objectives of the PIP	• Increasing agricultural productivity and production. • Directing a flow of production to the internal market in order to reduce prices. • Creating an entrepreneurial class of small-and medium-sized rural producers.
Form	Voucher for fertilisers, seeds and pesticides, technical assistance, rural insurance and a small sum of money for labour and mechanisation.
Quantity of inputs	Package to plant 4 hectares with modern technology: 1,000 kg of fertilisers (20 sacks of 50kg), 60kg of seeds, 3 visits by technicians.
Process	The beneficiaries are identified by the district authorities and the banks, with mobile assistants visiting them to conclude the contract, the value of which is around US$ 1,000 per farmer. The farmer receives vouchers to collect the inputs at associated shops. The suppliers of the inputs then exchange the vouchers for money at the commercial banks. The farmers pay the loan with 4% interest per year to the commercial banks. If the harvest fails, there is an insurance policy of 2% included in the contract, which covers the loss. If the default is larger and generalised, the losses will be debited to guarantee fund which is available to the banks for this purpose. The banks earn an overhead of 10% and do not have any risk.
Focus criteria	Emerging producers able to incorporate modern technologies of the Green Revolution

	and to pay for the cost of the programme (4-10 hectares, who today produce 37% of the total agricultural GDP of Mozambique). Zones with reasonable agroecological conditions and rainfall: Nampula, Sofala, Zambezia, Cabo Delgado, Tete, Niassa, South region (irrigated areas).
Products financed	**Maize, rice, wheat, beans, sweet potatoes, tomatoes, onions, cabbages**
Quantity of inputs used	Calculated at 145,000 tonnes of fertilisers of 3 years and 870,000 kg of hybrid seeds.
Value payable	The farmer returns 100% of the received amount (US$ 1,000) plus 4% interest.
Source of financial resources	Budget (PES), international donors, issuance of securities.
Purchase of inputs	Must be purchased from suitable firms, who guarantee the efficiency of the hybrid seeds and fertilisers. The purchasers of the inputs are the supply companies and not the government.
Reimbursement	The cost to the Government shall be US$ 210 million, of which US$ 165 million is reimbursable. The effective cost is given by the default risk, overhead and equalisation of interest, amounting to US$ 45 million in total.
Supplementary activities	Consists of seven (7) coordinated sub-programmes: • Recovery of district roads. • Financing for the rehabilitation of warehouses, shops and cantinas and agroindustrial processing systems: US$ 4,000-15,000 per beneficiary, with an estimated 3,000 traders to be financed. • Associated input companies for the provision of inputs • Banking system available with branches or vehicles in 100 districts of the country. • 2012/2015 season credit of US$ 1,000 per farmer. • Outsourced technical assistance. • Rural insurance.
Impact of the programme	1- Production of cereals increased from 1.7 million tonnes to 2.9 million tonnes in 3 years: increase of 70%. 2- Income of farmers increases from a current US$ 1,000 to approximately US$ 4,000, if the rice/beans system is applied over 4 hectares, or increases from US$ 1,000 to US$ 3,000 if the maize/rice system is applied over 4 hectares.

APPENDIX 6

INNOVATIONS IN RURAL CREDIT AND FINANCE METHODOLOGY IN AFRICA

Since the signing of the CADAAP agreements in Maputo, various African countries have unveiled and attempted to apply a number of new ideas and instruments to permit greater access by their rural populations to rural credit. Among these, the following should be highlighted:

1. Focusing of credit on the group of "Emerging Farmers"

As has previously been seen, few farmers have access to financial services in Africa. Most commercial banks are not interested in operating in these areas due to low income levels, lack of economies of scale and of infrastructure. The absence of financial institutions in rural Africa has obliged governments to intervene, particularly through state banks focused on agriculture. Many of these initiatives have nevertheless failed, since these banks were very bureaucratic, heavily oriented by political questions with little focus on the customer and with high exposure to risk. Governments required subsidies to be for certain groups of very poor customers, leading to a very low rate of loan recovery.

A new system inaugurated by Rabo Development (RD)[48], in alliance with RaboBank, permitted the expansion of access to financial services in the rural zones of developing countries. RD participates in financial institutions and provides management and technical assistance services in countries such as Tanzania, Zambia, Mozambique, Rwanda, Paraguay, Brazil and China. RD also works with cooperative "companies" and financial institutions who wish to increase their own access to financial services.

Policy instruments which indicate risk or sharing of costs can only be effective if there is a clear segmentation of the customer base. Customers with sufficient payment capacity receive credit and may even be exempted from the need to provide guarantees, but customers with insufficient payment capacity will not receive loans but assistance through income support mechanisms.

Emerging farmers justify an individual approach, since they have the potential to transform themselves into commercial or professional farmers with a corresponding increase in access to financial services. Rigorous criteria are established for minimum size, sufficient entrepreneurial spirit, basic knowledge of business planning and

[48]This is a system created by the Dutch to support developing countries with bank credit. For further details, cf.: *Gerard van Empel,*The Rabobank Approach to Food, Agriculture, and the Environment Focus 18 • Brief4 • July 2010

agricultural management skills. With a combination of financial services and technical support, these farmers receive a fair chance of success.

The emerging farmers may be financed within the context of the existing retail structure of a private bank, but the involved local branches must recruit specialists who understand agriculture and have the capacity to assess the specific risks associated with this activity (including, among other things, climate, diseases and price risks).

In Zambia, the emerging farmers programme was launched on the basis of the following appraisal: there are three groups of farmers in Zambia: a) a small group of commercial farmers who are often responsible for most of the agricultural production of the country. These commercial farmers are capable of providing the necessary management information to the banks, as well as technical and financial results and already have good access to funding; b) emerging farmers: farms of medium-sized farming families, which are currently too small to generate stable income and which have irregular access to funding. One difficulty is that they commonly provide technical or financial information to the bank, which is unreliable; c) small farmers or peasants. The third group, forming the lower part of the pyramid, consists of very small farmers or peasants who are too small to develop their farms to a level which allows them to generate a sustainable income.

The first group can be funded. In most cases, these farmers are already bank customers. The second group has scope to grow and professionalise themselves, so that medium-sized farmers can earn income compatible with the returns from their farms. This is the group within which the "emerging farmers" programme is concentrated in Zambia. It is very difficult for a bank to service the third group, since peasants have little land and insufficient capacity for generating returns. This group can only be reached by the bank through outsourcing and credit cooperative systems.

In Rwanda as well, in cooperation with the partner bank of the city and Rhuanda National Farmers Union (RNFU), Rabo Bank initiated a programme of this type, aiming to improve production and agricultural productivity. Its main objective is to work within the agricultural value chain.

The objective is to provide support, on the basis of rigorous business principles, to a group of farmers which is unable to access bank funding on a normal basis. The focus is on farmers with proven business skills, track records, arable areas above a minimum size and sufficient assets to develop their activity. Transforming these farms into larger, independent commercial farms will permit the growth of commercial agriculture within the country.

In Zambia, as in the majority of African countries, the level of professionalism of farmers is inadequate for achieving good results and producing high quality products. Consequently, an important part of this programme consists of providing technical and economic assistance to participants.

2. Innovative rural insurance systems:[49]

Some microinsurance systems adapted to rural zones provide useful lessons. For example, a pilot project in India, created by the microcredit institution BASIX and a commercial insurer, with the aid of the World Bank, has provided weather insurance, allowing small farmers to improve their access to credit. This microinsurance regime is based on a rainfall index. Payments are based not on adjustments of individual losses, as this evaluation is not feasible for microinsurance, but on whether rainfall measured at a local meteorological station reaches a given threshold. Insurance contracts are linked to credit since the insurance protects the reimbursement of the loans.

Since the outset, the project has had to overcome various problems, of which the main one was poor quality meteorological services. Others, such as basis risk (which arises when the real loss does not correspond to the benefit because a payment is activated, but there is no loss or vice-versa), high premiums and the difficulties customers have in understanding a complex product, also had to be overcome. At the same time, the insurance market for weather events is growing strongly and new providers of microinsurance are entering the market.

India was the first country to approve regulations applicable to microinsurance products and agents (2005). India also made it obligatory for insurers to provide microinsurance to rural and social sectors (the "social sector" includes the non-organised or informal sector).

Insurance regulators in other countries are also working to create a favourable environment for insurance products, distribution channels and new providers. Brazil and Ghana are among the countries which are modifying their regulations and South Africa has the objective of incorporating thousands of informal burial societies into the traditional insurance sector.

The Philippines has also regulated rural insurance. In 2006, the Philippines Insurance Commission published a memorandum, Circular 9-2006, which provided a definition of microinsurance and stipulated the registration requirements for a mutual benefit microinsurance association. As a result, by the end of 2009, microinsurance mutual associations covered 2 million insurees. The Government of the Philippines is now seeking a broader approach, which aims to increase access to microinsurance services and products, including different types of actors. Its national microinsurance strategy and regulatory framework is concentrating on increasing the share of the private sector in providing microinsurance services and the integration of informal insurance (Focus 18, 2011).

[49]For further details, cf.: *Martina Wied*m*aie*r-Pf*ister and* Br*igitte Klein*Microinsurance Innovations in Rural Financefor Food, Agriculture and the EnvironmentFocus 18 • Brief12 • July 2010

3. Integrated transaction platforms with the use of vouchers for the provision of rural credit inputs[50]

The DrumNet project, which has been operating in Kenya since 2005, establishes relations with key actors along a supply chain, a purchaser, a bank and various agricultural retailers, who are linked to small farmers via a Transaction Platform which operates the entire process, integrating funding, production, delivery and payment.

The process begins when farmers (organised into groups) sign a fixed-price purchase contract with a processor or grain dealer. The contract allows farmers to approach a partner bank and to obtain credit and inputs from a certified local retailer. At harvest time, the contracting products are collected, classified and sold to the purchaser at the designated collection points. A successful transaction activates a payment via a bank transfer.

DrumNetserves as an intermediary in the payment flow to guarantee that the credit is reimbursed before the sold product reaches the account of the farmer. A master contract governs the entire process, which is monitored by DrumNet IT system.

The process creates an environment favourable to agricultural finance. Firstly, banks have the guarantee at the time of granting the loan that farmers have a market for their products and the resources for servicing this market adequately. Secondly, banks minimise the problem of misuse of the loan, offering credit in kind to farmers for inputs, which are paid directly to the retailers after they are distributed. Finally, the payment made through a bank transfer reduces any opportunism, since farmers may not use their revenues until their outstanding loans have been reimbursed in full.

DrumNet has implemented pilot projects with this approach for the vegetable and oilseed sectors within Kenya, servicing over 3,000 rural producers in five provinces.

4. Mobile banks to guarantee access by farmers to credit[51]

Mobile banks offer banking assets and services to many small companies and farmers directly at the location of the latter. The services offered are the same as those

[50]Based on Jonathan Campaigne&Tom Rausch.FinanceBundling Development Services with Agricultural Finance: The Experience of DrumNetFor Food, Agriculture, and the Environment Focus 18 • Brief14 • July 2010

[51]Based on Adeleke Salami, Abdul B. Kamara and Zuzana Brixiova.Smallholder Agriculture in East Africa: Trends, Constraints and Opportunities, Working Papers, African Development Bank*Financing Agriculture and Access to Credit*

offered at branches or the headquarters of the bank, including deposits and saving, money transfers and processing of remittances and loans.

This service reduces customer congestion at existing branches. Mobile clients only pay a small additional charge for their mobile services.

This system began in Kenya in 1984, with a bank (*Equity Bank*) which developed from a microfinance institution into a publicly listed commercial bank. It succeeds in bringing mobile banks to some of the most isolated zones of rural Kenya, which lack access to commercial financial institutions, such as 5 villages and over 100 small producers and farmers in the remote district of Siaya, which now has access to a bank.

The development programme of the United Nations provided US$ 81 million in loans, in partnership with a bank, to a fund which serves women. In order to grant the loans, it bases itself on an evaluation of the cash flow of the applying company, instead of real guarantees. Customers may request loans from US$ 25 to US$ 160,000 or more, depending on their past reimbursement profile.

A new partnership was launched by *Equity Bank* to provide financing to small farmers and agricultural companies to escape from poverty and build viable businesses. This partnership has been formed between Alliance for Green Revolution in Africa (AGRA), *Equity Bank*, the International Fund for Agricultural Development (IFAD) and the Kenyan Ministry of Agriculture, having already granted US$ 50 million in loans to accelerate access to funding for 2.5 million farmers and 15,000 members of the Agricultural Value Chain, such as rural shops, [suppliers of] fertilisers and seeds, wholesalers and importers, grain merchants and food processors.

This programme is operating in parallel with a US$ 5 million fund named the "Fundo de Garantia" [Guarantee Fund] of AGRA and IFAD, which will reduce the credit risk component of Equity Bank.

Standard Bank of South Africa, the largest African bank (with over 100 years of experience in large-scale financing of agriculture) also signed a US$100 million contract with AGRA in March 2009. The objective of the transaction is to provide financing for small farmers and agricultural companies in Eastern and Southern Africa.

In particular, AGRA and Moçambique Millennium Challenge Account (MCA) shall provide a guarantee for 20% of loans or credit operations in Tanzania, Uganda, Ghana and Mozambique over the next three years. Standard Bank is taking on a risk in the hope of initiating a form of profitable commercial credit for agriculture, which represents a major growth area.

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