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Multi Annual Adaptation Strategy

Action Plan 2006-2015: Safeguarding the future through consensus

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additional revenue, optimal use of by products, the pro-poor dimension, debt alleviation, adapting regulation and synergies.

- The fourth part relates to sugar production level, in particular the fulfillment by Mauritius of its international trade commitments, whilst the fifth part refers to the sugar cane cluster, its prerequisites and how it is put in place.

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Ministry of Agro-Industry & Fisheries
18 April 2006

Executive Summary

1. Mauritius is faced today with the triple challenge of coping with a high budget deficit; adapting to the erosion of preferences in respect of sugar and textiles in a situation where the balance of trade is negative; and facilitating the emergence of new poles of development.

2. These challenges have to be viewed against the background of the triple shock facing Mauritius, namely the 36% reduction of the sugar price brought by the reform of the EU Sugar Regime; the continually rising oil prices; and the dismantling of the Multifibre Agreement and the WTO negotiations on Non Agricultural Market Access which would adversely impact on the Textile and Clothing and Fisheries sectors. **Never did the country face odds as formidable as in the present context**

3. The sugar sector will have to face lower sugar prices and fiercer competitors, having unlimited access, at the same time. The textile sector, which has already lost 1/4 of its labour force in the last three years, will not only face competition from China but also the drop in the tariff protection in preferential markets with further adverse social and economic consequences. While tourism is a very promising sector, it is quite fragile given its dependence on extraneous factors namely international events including the spread of new viruses and social peace and harmony. Moreover, the tourism sector depends on the positive externalities of the sugar industry: soil conservation and the prevention of silt deposit in lagoons, greenery and aesthetic effects of cane plantations.

4. Thriving sugar and textile sectors were until recently the pillars of this harmonious social situation. However, the level of job losses in these two sectors can now become threats to this harmony. Accordingly, any sector restructuring plan has to comprise an adaptation and empowerment component.

5. The triple shock comes at a time when the relevant indicators point to a deterioration of the economy and of public finance. Unemployment rate stands at 10 %, the budget deficit amounts to 6% of GDP while the deficit of the balance of visible trade is Rs 48 billion i.e 1.3 billion €. The overall balance of payments would move from a surplus of some Rs 5.9 billion in 2002 to a projected deficit of Rs 9.5 billion in 2009.

6. Loss of export earnings in respect of textiles and sugar and a rising import bill will further aggravate the balance of visible trade and the overall balance of payments. In the case of sugar, the reduction in price in the EU means a shortfall in export earnings of 782 M€ over the 2006-2015 period. The effective loss to the economy is in fact much higher if the social and environmental multiplier effects of the sugar industry are taken into account.

7 Government in response to the triple challenge is preparing a ten year adaptation strategy for the overall economy and this strategy will be formulated in a Country Strategy Paper (CSP). Within the latter, the strategy provides for the adaptation and full integration of the sugar sector to the new environment and will be based on the Action

Plan. Funds accruing to Government in the context of the Country Strategy Paper or the Accompanying Measures would be in the form of General Budget Support

8. Sugar cane, through its considerable resistance and resilience to drought and more particularly to cyclones, has been the crop which has proved beyond doubt its capacity to be a viable crop on a long term commercial basis. Many other crops have been tried over time, through specific and often costly research and field testing programmes, but none has been able to adapt itself to Mauritian conditions**.** While diversifying its economy through the judicious use of the secure and predictable earnings derived from the Sugar Protocol , Mauritius has also adopted a "**diversification within sugar**" approach i.e. optimisation of the use of by-products; the production, to the extent possible, of value added sugars; food crops in cane interlines and cane rotational land. In fact, food crop production has been quite successful in these cane lands.

9 Sugar cane is far more than a cash crop in Mauritius. In fact its multifunctional role in Mauritius is such that the country has no other alternative but to continue the cultivation of this crop. This role encompasses both direct and indirect contributions, namely economic return for all operators, small and large; gainful income for employees; net fund flows for the overall economy; food procurement capacity; reduction of the dependence of the country on imported oil; development and stability of the rural areas; protection of the environment; soil and water conservation; prevention of degradation of the landscape; maintenance of the multiplier effect of the sector; and a sustainable agricultural sector**.** In many developed countries, the resources for the fulfillment of the multifunctional role are procured by a combination of revenue obtained through production and sale of goods and production-decoupled financial support. The latter emanates from Government sources. In the case of Mauritius, a small vulnerable developing country, **the only resource to ensure multifunctionality remains the remunerative flow of export earnings procured through production and sales of sugar under the Sugar Protocol.**

10. Reform in the sugar industry has been an ongoing process ever since 1984. In the light of the formidable threats ahead, Government examined two options, should reform continue at the same pace or should it be accelerated and deepened. Under the first option the country would no longer be competitive as from 2009 with severe social, economic and environmental consequences, whereas under the second option, if all projects are duly implemented, the country would be in a position to be a cost effective and competitive supplier on the EU market. This competitiveness has been assessed by authoritative international consultants in respect of costs of production of sugar and isoglucose.

11. Government established a dialogue process with the stakeholders based on the principle of a bottom-up approach purporting to achieve consensus and the full ownership of the strategy by all stakeholders This facilitated the preparation of a multi-annual adaptation strategy in the form of a ten year, 2006-2015, Action Plan which would enable the sugar industry to be competitive, viable and sustainable in the long term and thereby allow it to continue fulfilling its much needed multifunctional role.

12 The reform to be undertaken through the Action Plan is comprehensive and aims at addressing two of the three shocks (sugar and oil) affecting the country through, firstly, ensuring the long term viability and sustainability of the sugar industry and secondly, fully tapping the energy potential of this industry through the generation of electricity from bagasse (fibre left after the milling of cane stalks) and coal, a complementary fuel to bagasse, and the production of ethanol. Moreover, the provision of cheaper energy will be of interest to a country which will have to develop electricity and energy intensive emerging sectors. It is to be noted that of all cultivated crops sugar cane is one of the most efficient converter of solar energy into renewable biomass.

13. However, these objectives can only be achieved if the cane and sugar activities, indeed the core businesses, are viable and sustainable.

14 In this already difficult and challenging situation, the low level of financial resources by way of Accompanying Measures and the schedule of disbursement thereof being proposed by the EU significantly compound the country's difficulties. The resources and the schedule do not match the requirements to achieve the major part of the reform prior to the coming into effect of the substantial price cuts. Thus 87% of the investments (585M€) under the Action Plan would have to be effected from 2005 to 2010.

15 The Action Plan has been prepared after taking stock of the constraints of the sugar industry and of those factors that are conducive to the successful implementation of the Plan and evaluating the market environment.

16. The main constraints relate to the limitations to the expansion of production; the absence of economies of scale in the operations of small planters; the relatively small size of sugar factories; over manning of production entities and institutions servicing the industry; the non optimization of the use of the by products of sugar, namely bagasse and molasses; a low proportion of value added sugar in total exports ; the level of indebtedness of large producers and the absence of financial resources at the level of small planters; regulatory constraints ; the high costs incurred in the operation of service providing institutions; the losses incurred in the sale of sugar on the local market; and the non optimization of synergies between the various stakeholders of the industry.

17 On the condition that adequate financial resources are available, Mauritius can successfully implement the Action Plan by taking advantage of the commitment of Government and of all stakeholders to undertake deep and bold reform; the experience acquired over the past twenty years in implementing reform; the fact that labour rightsizing plans are socially acceptable and can lead to significant cost reduction; the fact that expected gains in cane productivity from small planters fields are substantial; the full optimisation of bagasse, which in any case is economical, and molasses, the use of the latter being facilitated by the ever rising price of oil; the fact that revenue can be enhanced through a rationalization of service providing institutions and the elimination of

losses incurred in the sale of sugar on the local market ; and the good track record in terms of the production and supply of direct consumption sugars

18. The EBA initiative; the reform of the EU Sugar Regime in terms of a substantial price reduction, new seller/buyer relationships and corporate merger and acquisition strategies; enhanced opportunities to sell higher amounts of value added sugars as well as the inevitable rise of oil prices will bring about a significant change in the market environment. The Action Plan has duly taken into account these critical elements.

19. The analysis of the market environment has led to the formulation of five overall objectives. **Firstly**, the transformation of the sugar industry into a **sugar cane cluster**. This transformation means that the industry moves from an essentially raw sugar producer to a situation where it produces several types of sugar i.e. raw, special ,industrial and white; electricity from bagasse/coal using state of the art technology and ethanol using molasses. **Secondly,** the establishment of a competitive, viable and sustainable sector. **Thirdly,** the fulfillment of the trade commitments of the country. **Fourthly,** the reduction of the dependency on the import of fossil fuels generally and on oil in particular. **Fifthly**, the continuation of the multifunctional role of sugar and in particular the support to national environment and social objectives.

20. The Action Plan is made up of projects for which funding would be sought as well as elements which depend on Government and Producer intervention. Accordingly, the Action Plan is articulated along components and subcomponents destined to respond to the new market environment and address the constraints of the sugar industry. The components are cost reduction, additional revenue, the optimal use of by products, the pro poor dimension, debt alleviation, adapting regulation and synergies.

21. **Cost reduction** will be achieved through the closure of seven out of the existing eleven factories whereby three of the remaining four would produce more than 100,000 tonnes of sugar; the rightsizing of human resources in production entities to reduce the level of labour costs both in absolute and relative terms; the facilitation of recourse to seasonal labour; the substantial reduction of overhead costs at operational, administrative and institutional levels; the reduction of the level of indebtedness to bring down financial charges; and the derivation of full benefits from economies of scale at all levels, corporate sector and small and medium planters**.**

22. **Additional revenue** will be secured through sales of a higher proportion of value added direct consumption sugars i.e. moving from the current 15% of total sales to 50% or more through a bold, innovative and aggressive marketing strategy; the elimination of the losses incurred by producers on sugar sold on the local market; the substantial reduction of the cost of operation of the institutions servicing the sugar ;higher sugar output through the cultivation of high sucrose cane varieties; and earnings obtained from the optimization of by-products**.**

23. **The optimisation of the use of by products** will lead to an enhanced production of renewable energy thereby displacing the use of fossil fuels. Thus electricity production

from bagasse would be increased by 300 million kWh (300 GWh) and 30 million litres of ethanol would be produced from molasses. The ethanol would be used to blend with gasoline. Research in cane varieties having higher fibre content will be stepped up.

24. The key to a **socially acceptable** Action Plan is its **pro poor dimension**. This is achieved through the provision of an attractive package to those employees voluntarily terminating their contract of employment in the context of the rightsizing of production entities and service providing institutions or in the context of factory closure and the provision of reskilling and loan opportunities to facilitate adaptation. The employees will also participate in empowerment and welfare schemes being set up by Government. These schemes will also tackle the problems of women losing their jobs as well as the adaptation of Trade Unions. The small planter sector will benefit from incentives and assistance to enable them to regroup into larger units and thereby increase their yields and lower their cost of production.

25. A series of measures are being taken to **alleviate debt. Legislation** would be enacted to facilitate the operation of the sugar cane cluster. **Synergies** will be fostered through cane cultivation agreements between millers and planters and enhanced participation in equity.

26. The centrepiece of the Action Plan is the establishment of the sugar cane cluster made up of **sub-clusters** which would be operational around the four remaining sugar factories .The success of the cluster rests on a few critical factors , namely in descending order of importance: the operation of very efficient and sizeable sugar factories, the adequate provision of energy in the form of steam and electricity, a reliable and sustainable supply of canes both from large and small planters, the operation of efficient and flexible state of the art installations to produce different types of sugar and to optimize the use of bagasse, molasses and the further strengthening of the commonality of interests between the other stakeholders and the millers.

27. After the implementation of the Action Plan, sugar production will reach 520 000 tonnes produced over 63 000 hectares with 20 % of total production coming from small planter regrouped plantations. This production level would be sufficient to ensure that the country fulfils its international trade commitments in respect of the Sugar Protocol and the US Global Import Quota.

28. The other key features of the Plan would be the regrouping of small planters involving 12 000 hectares of land with yields increasing by 20% and costs going down by 20%; the provision of irrigation over 7000 hectares; some 7200 employees voluntarily terminating their contract of employment; the closure of seven factories; the commissioning of five 42MW/82 bar and one 35MW/82 bar bagasse/coal power plants; the commissioning of two ethanol distilleries and an ambitious research programme destined to develop and release for commercial cultivation high sucrose and high fibre content canes to improve both sugar and energy production.

29. The cost of production would be significantly reduced and this will enable Mauritius to be a cost effective and competitive supplier on the EU market when compared to ACP, LDC and EU sugar producers and EU isoglucose producers.

30. The cost of the eight projects, namely field operations and regrouping of planters, the Voluntary Retirement scheme, difficult areas, centralization of sugar factories, commissioning of bagasse/coal power plants, commissioning of ethanol distilleries, cess reduction and research and development added to the requirements for debt alleviation and for the social safety nets and the empowerment fund indicate that an amount of Rs 25 billion (or 675 M€)is required to implement the Plan. 87 % of this amount will have to be spent on or before 2010.

31 Government commissioned international consultants, whose report is appended to the Action Plan, to evaluate the multifunctional role of the sugar industry and to validate the Action Plan. This has been done. The consultants have in their task assessed the competitiveness of Mauritius on the EU sugar market. They have also conducted a through analysis of the sustainability of the Plan from the social, economic, financial and environmental perspectives on the basis of a comprehensive set of criteria and have concluded that the Action Plan, with the implementation wherever necessary of impact mitigation measures, would be sustainable from every perspective. **Moreover, the Plan in its approach, methodology, objectives and focus fully conforms with the guidelines and criteria specified in the Working document of the Commission on the Action Plan on accompanying measures for Sugar Protocol countries affected by the reform of the EU sugar regime of January 2005.**

32 A prioritisation or ranking exercise has been conducted in respect of the funding of the projects. They have been classified in four categories. The **first** one relates to projects that have both the economic and social dimensions namely VRS, social costs of factory closure, enhancement of the competitiveness of planters; revenue support in difficult areas, cess reduction and the provisions for the social safety net under a revamped Social Aid program and contributions to the Empowerment Fund . The **second** one refers to the energy dimension of sugar cane due regard being had to the possibility of obtaining funds from banks, the local stock exchange and strategic foreign investors. In this category, the sequence in descending order is research in cane biomass, ethanol production and electricity generation. The possibility of tapping funds from the EU-ACP Energy Facility has been considered. The **third** category relates to debt alleviation having regard to a market oriented restructuring based on attracting equity. The **fourth category** comprises projects that would have to be funded by the corporate sector in respect of factory modernization, land preparation, mechanization and irrigation

33 Subsequent to the ranking exercise, an allocation system has been worked out to determine the sharing mechanism at project level between accompanying measures, other sources of finance and producer own funds. Funding would come from a variety of sources : the accompanying measures , the ACP-EU Energy Facility, other ACP-EU Funds, bilateral sources and producer funding through loans or own funds.

34. The most difficult years from the funding and profitability angles would be **2007 to 2010.** In these years nearly 70 % of the total investment would have to be made .The difficulties of this period are compounded by the fact that there is a time lag between an investment and the flow of the stream of benefits derived therefrom. This is particularly true in the case of the significant investments that are incurred in respect of sugar factories and power plants. Moreover, the development of markets and access thereto for value-added products takes time. In such a situation recourse to bridging finance becomes necessary and Government will facilitate the process.

35. The rigour and the highest standards of financial good governance will apply to the use of the funds accruing under accompanying measures .The audit in respect of the use of the accompanying measures would be effected by the Director of Audit whose independence is guaranteed under the Constitution of Mauritius;

36. The monitoring of budgetary performance would be undertaken on the basis of performance indicators to be jointly agreed between Government and the Commission's delegation in Mauritius. The indicators would have to be consonant with the objectives of the Plan and be sufficiently flexible to accommodate the specificities of sugar in Mauritius. The monitoring of the implementation of projects would be undertaken in a three tier system comprising the overseeing of the whole plan, institutional coordination for major and comprehensive projects and detailed implementation follow up;

37 The Action Plan would be **reviewed** in 2009 to assess its implementation and its relevance to the market environment. Modifications if necessary would be effected.

38. Sugar has been associated with Mauritius over some 367 years and it has shaped every aspect of the history and culture of this country. Accordingly, the formulation of a bold, deep and comprehensive Action Plan has been a lengthy and painstaking exercise. Government has had to reconcile economic, social, distribution, energy and environmental considerations. Accordingly, the Action Plan 2006-2015 represents a delicate balance which has to be viewed from a global perspective.

39. The reform undertaken under the Action Plan 2006 – 2015 will not only enable the Mauritian Sugar cane Cluster to sail safely in the future but more importantly safeguard a crop which from 2015 onwards will be an invaluable asset in terms of the production of renewable environment friendly energy, and which has the potential of being an efficient multiproduct biofactory for the production of high value-added products including proteins, pharmaceuticals, vaccines, polymers and textiles.

40. Government is committed to the well being of the sugar sector and will ensure that the Action Plan is fully implemented in a timely manner.

Ministry of Agro-Industry & Fisheries
18 April 2006

Multi Annual Adaptation Strategy

Action Plan 2006-2015: Safeguarding the future through consensus

A. The global context and the purpose of reform in the sugar sector

A.1 The difficult economic and budgetary situation

1. Mauritius is faced today with the triple challenge of coping with a high budget deficit; adapting to the erosion of preferences in respect of sugar and textiles in a situation where the balance of trade is negative; and facilitating the emergence of new poles of development.

2. These challenges have to be viewed against the background of the triple shock facing Mauritius, namely the 36% reduction of the sugar price brought by the reform of the EU Sugar Regime; the continually rising oil prices; and the dismantling of the Multifibre Agreement and the WTO negotiations on Non Agricultural Market Access which would adversely impact on the Textile and Clothing and Fisheries sectors.

3. The threats to the Mauritian economy are not only of a potential nature but real and they will materialise in a very near future. There will be a **BIG BANG** for Mauritius in 2008 which will be the decisive year on account of these threats and the ensuing challenges to be addressed. Indeed in 2008:

(i) The Doha Development Agenda would most probably be in its first year of implementation;

(ii) The quota restraints on Chinese textiles exports, pursuant to its accession to the WTO, would have lapsed;

(iii) Duties on LDC sugar, many of which are low cost producers, would be reduced by 80% before their elimination in the following year i.e. a near duty free situation*;*

(iv) The first major price cut for ACP sugar on the EU market, 17%, would take place in 2008.

4. The sugar sector will have to face lower sugar prices and fiercer competitors, having unlimited access,at the same time. The textile sector, which has already lost 1/4 of its labour force in the last three years, will not only face competition from China but also the drop in the tariff protection in preferential markets with further adverse social and economic consequences. While tourism is a very promising sector, it is quite fragile given its dependence on extraneous factors namely international events including the spread of new viruses and social peace and harmony.

5. **Thriving sugar and textile sectors were until recently the pillars of this harmonious social situation**. However, the level of job losses in these two sectors can now become threats to this harmony. **Accordingly, any sector restructuring plan has to comprise an adaptation and empowerment component**.

6. The triple shock comes at a time when the relevant indicators point to a deterioration of the economy and of public finance. Table 1 below gives the key indicators in respect of the economy and the Government budget and projects likely outcomes in the absence of reforms and continuation of expected trends and policies.

Table 1: Key economic and budgetary indicators

	Unit	2002	2003	2004(1)	2005(1)	2006(2)	2007	2008	2009
GDP, mp	*Rs bn*	143	157	176	187	202	223	247	273
GDP, mp growth	*%*	2.1	4.3	5.7	2.5	4.4	3.1^	1.7^	1.0^
GDP, bp growth	*%*	2.1	4.4	4.7	2.7	4.7	3.8^^	2.4^^	1.5^^
GDP, bp growth excl. sugar	*%*	3.6	4.5	4.6	3.2	4.6			
Inflation	*FY, %*	6.3	5.1	3.9	5.6	5.0	5	5	5
Inflation	*CY, %*	6.4	3.9	4.7	4.9	5	5	5	5
Budget Deficit	*FY, % GDP*	6.1	6.2	5.4	5.0	5.0	6.6	8.7	9.3
Public Debt	*FY, % GDP*	52.6	56.7	56.2	58.3	57.8	58.9	61.9	65.5
Total Public Sector Debt*	*FY, % GDP*	71.7	73.8	70.2	70.2	69.9	72.8	75.5	77.2
Balance of Visible Trade	*CY, Rs bn*	-10.7	-12.9	-21.5	-30.0	-48.0**			
Current Account	*FY, % GDP*	+5.4	+2.4	+0.8	-3.4	-3.8	-3.9	-1.6	-0.7
Overall Balance of Payments	*FY, Rs bn*	+5.9	+9.1	+3.2	-3.1	-7.1	-9.6	-8.5	-9.5
Unemployment	*mid-yr, %*	7.3	7.7	8.5	9.5	10.0			

^ based on earlier projection of 3.3% growth for 2006
^^ based on earlier projection of 4.2% for 2006
* Includes debt of parastatals (domestic and foreign)
** Includes acquisition of two aircrafts worth Rs 10 billion.

Source Ministry of Finance

7. Loss of export earnings in respect of textiles and sugar and a rising import bill will further aggravate the balance of visible trade and the overall balance of payments. In the case of sugar, the reduction in price in the EU means a shortfall in export earnings of 782 M€ over the 2006-2015 period. The effective loss to the economy is in fact much higher if the social and environmental multiplier effects of the sugar industry are taken into account.

8. The difficult budgetary situation and high and rising level of public debt also means that Government has neither resources to inject into the sectors that are in difficulty nor would it be in a position to take over a certain number of charges currently incurred by the sugar industry.

9. Government in response to the triple challenge is preparing a ten year adaptation strategy for the overall economy and this strategy will be formulated in a Country Strategy Paper (CSP). Within the latter, the strategy provides for the adaptation and full integration of the sugar sector to the new environment and will be based on this Action Plan. Funds accruing to Government in the context of the Country Strategy Paper or the Accompanying Measures would be in the form of General budget Support to provide maximum flexibility in financing the restructuring program of the Government which rests on four pillars:

(i) Fiscal Consolidation while rapidly proceeding to a Duty Free Island;
(ii) Improving the Investment Climate;
(iii) Restructuring sectors affected by trade shocks namely sugar and textiles;
(iv) Proactive efforts to attract foreign investment.

10. The Economic Partnership Agreement (EPA) between the Eastern and Southern African (ESA) region and the European Union will come in effect as from 1 January 2008. New policy space created by the EPA could act as a boost to the emerging sectors.

A.2 The reform in the sugar through a multi annual adaptation strategy

11. The multifunctional role of the sugar sector is considered as a critical element by Government. This role encompasses both direct and indirect contributions, namely economic return for all operators, small and large; gainful income for employees; net fund flows for the overall economy; food procurement capacity; reduction of the dependence of the country on imported oil; development and stability of the rural areas; protection of the environment; soil and water conservation; prevention of degradation of the landscape; maintenance of the multiplier effect of the sector; and a sustainable agricultural sector**.** In many developed countries, the resources for the fulfillment of the multifunctional role are procured by a combination of revenue obtained through production and sale of goods and production-decoupled financial support. The latter emanates from Government sources. In the case of Mauritius, a small vulnerable developing country, **the only resource to ensure multifunctionality remains the**

remunerative flow of export earnings procured through production and sales of sugar under the Sugar Protocol.

12. Accordingly, Government, in consultation and collaboration with stakeholders, has devised a multi-annual adaptation strategy in the form of a ten year, 2006-2015, Action Plan which would enable the sugar industry to be competitive, viable and sustainable in the long term and thereby allow it to continue fulfilling its much needed multifunctional role. A reformed industry will enable the country to fully meet its international trade commitments.

13. Reform in the sugar industry is on going process since 1859 but to which new impetus was given as from 1984. Competitiveness Improvement Programmes have been a permanent feature of the sugar industry ever since 1984, when for the first time Government came up with an overall strategy for the sugar industry. This strategy was reviewed in 1988 through a major study, the Sugar Industry Efficiency Study which laid down the framework for action for nearly a decade. The bagasse electricity and the reduction of oil dependency questions were dealt with in the Bagasse Energy Development Programme which was formulated in 1991.

14. The process has accelerated over the last twelve years. In 1994, a major deal was arrived at between Government and the sugar producers whereby in exchange for the abolition of the export duty on sugar by Government, sugar millers agreed to set up public milling companies where employees and planters through a Sugar Investment Trust (SIT) were entitled to 20% of the equity of the milling companies. This was a major step in democratisation bearing in mind the emotional and historic context which had been prevailing in the millers/planters relationship.

15. From 1996 to 2000, three sugar factories were closed on the basis of a framework worked out by Government in consultation with stakeholders, in 1997 and called the Blue Print on Centralisation of sugar Milling Operations in Mauritius. Nine power purchase agreements were signed, six for the supply of electricity in the crop season using bagasse and three for the year round supply of electricity using bagasse and coal. Factory modernization and upgrading were undertaken with one factory being in a position to produce more than 100 000 tonnes of sugar.

16. The major problem of lack of sufficient irrigation water drought in the North was resolved through the construction of a major dam, some 30M, and the rehabilitation of downstream canals and reservoirs.

17. However, a very severe drought in 1999 bringing about a crop reduction of some 45% and a very weak euro compared to the dollar substantially reduced funds available and investments come to a standstill.

18. The Strategic Plan (SSSP) 2001-2005 was prepared with accompanying legislation that resulted in a complete overhaul of the Sugar Industry Efficiency Act (SIE Act 2001). The most important milestones in its implementation are the voluntary

retirement scheme (VRS) of some 8000 employees of the growing sector, the closure of the three sugar factories, the signature of a power purchase agreement for a 2 x 42 MW bagasse/coal power plant. However, the high cost of the VRS and the administrative and market difficulties encountered in the sale of land to recoup the costs of the VRS have resulted in a significant debt burden for the industry.

19. **But never did the country face odds as formidable as in the present context**. Therefore this Action Plan that has been devised envisages deep and bold reform and the transformation of the sugar industry into a sugar cane cluster[1] through the mobilisation of all its financial, technical and human resources. The result should be a re-engineered, modern, efficient, multiproduct and integrated industry. Moreover, this restructuring is itself part of a wider economic restructuring plan to make the economy more resilient by developing new pillars of economic growth.

20. The reform to be undertaken through the Action Plan is comprehensive and aims at addressing two of the three shocks mentioned above through, firstly, ensuring the long term viability and sustainability of the sugar industry and secondly, fully tapping the energy potential of this industry through the generation of electricity from bagasse (fibre left after the milling of cane stalks) and coal, a complementary fuel to bagasse, and the production of ethanol. **Moreover, the provision of cheaper energy will be of interest to a country which will have to develop electricity and energy intensive emerging sectors**. However, the furtherance of the multifunctional role and the optimal tapping of the energy potential can only be achieved if the cane and sugar activities, indeed the core businesses, are viable and sustainable.

21. Although this Action Plan is an integrated programme with social, environmental and economic objectives, its central aim is to ensure the future viability of the core activities of growing and milling cane to produce bulk raw sugar. Without this, the sustainability of the entire sugarcane cluster — together with its social and economic objectives — would be in jeopardy.

22 In this already difficult and challenging situation, the low level of financial resources by way of Accompanying Measures and the schedule of disbursement thereof being proposed by the EU significantly compound the country's difficulties. The resources and the schedule do not match the requirements to achieve the major part of the reform prior to the coming into effect of the substantial price cuts. Thus 87% of the investments (585M€) under the Action Plan would have to be effected from 2005 to 2010.

B. Necessity of bold and deep reform

23. Regarding the future there are two fundamental questions to be answered:

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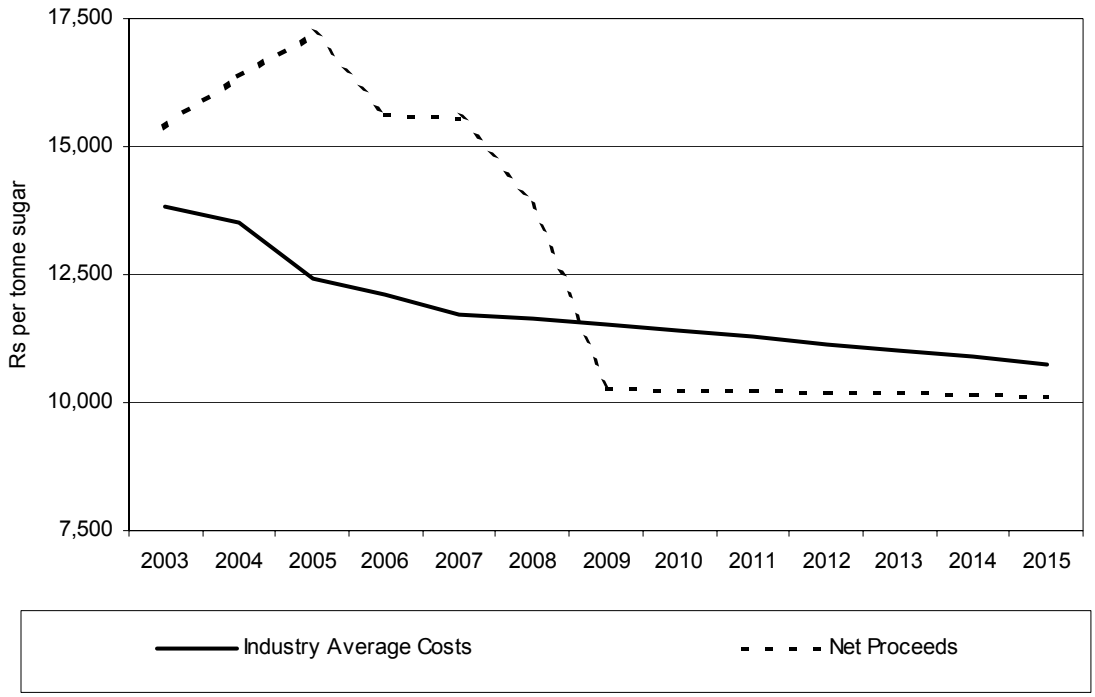
[1] The cluster comprises production of different types of sugar: raw, special, white and industrial, the production of electricity from bagasse/coal for export to the grid; the production of ethanol from molasses and eventually from cane juice; and the production of rum.

(i) What happens if the approach enunciated in the Sugar Sector Strategic Plan 2001-2005 is maintained?

(ii) Will the industry be competitive?

24. The analysis of Government on the implications of reform without accelerated restructuring has been confirmed by Landell Mills Consultants (LMC).[2] It has been found that although full implementation of the Sugar Sector Strategic Plan would reduce costs significantly, the ex-Syndicate price[3] after the implementation of the reform of the EU Sugar Regime would fall below the industry's full costs. If it were not to adopt more far-reaching reforms, the industry would therefore be unable to afford to reinvest fully in the sector. In the long term, this would lead to under-investment, and marginal lands would move out of cane production, lowering the industry's output. "**This would have considerable social, environmental and economic consequences".** (*The emphasis is by LMC*). Diagram 1 presents the comparison between industry average costs and the ex-Syndicate price and it is seen therefrom that the industry is no longer profitable as from 2009.

Diagram 1: Industry Costs versus Ex-Syndicate Prices



Source LMC

[2] Details on these consultants, their recruitment and involvement, are to be found in Section E.

[3] Price obtained by producers after all marketing and institutional costs have been deducted from the sales proceeds of sugar

25. Regarding the adverse consequences of a **business as usual approach**, the impact on the industry[4] will be as follows:

(i) Given its significant role as a provider of rural livelihood in Mauritius, and as a provider of housing, healthcare, education and training, recreational facilities, technical and financial assistance in many communities, the decline of the industry would clearly have major socio-economic consequences for the island, including the loss of up to 40 000 jobs. The impact of reform would equally be felt by the poorer sections of society, including the 28 000 or so small farmers and their dependents, and by the 1200 or so métayers who do not own land that can be used for alternative development or as collateral to gain finance for alternative investments.

(ii) As marginal producers move away from sugar, there could be an increase in the incidence of **unsustainable and unmanaged land-use in marginal production areas,** which may lead to increased soil erosion and pollution (e.g. through the introduction of more agro-chemical intensive crops).

(iii) There would most likely be a continued and increased use of fossil fuels on the island, as the opportunities for co-generation were reduced (due to a lack of bagasse) and the production of ethanol as a potential fossil fuel substitute becomes less commercially viable due to the possible need to import molasses to achieve a 20-25% fuel mix.

(iv) There would be a risk of over-development on parts of the island, as prime commercial land is sold off, with possible direct and indirect environmental and social risks from the construction activities and the secondary infrastructure to service this development.

26. Put together, the above impacts paint a rather dramatic and bleak picture for future environmental and social conditions in Mauritius if the sugar industry falls rapidly into decline. **There is therefore a clear need for the industry to accelerate its restructuring programme.**

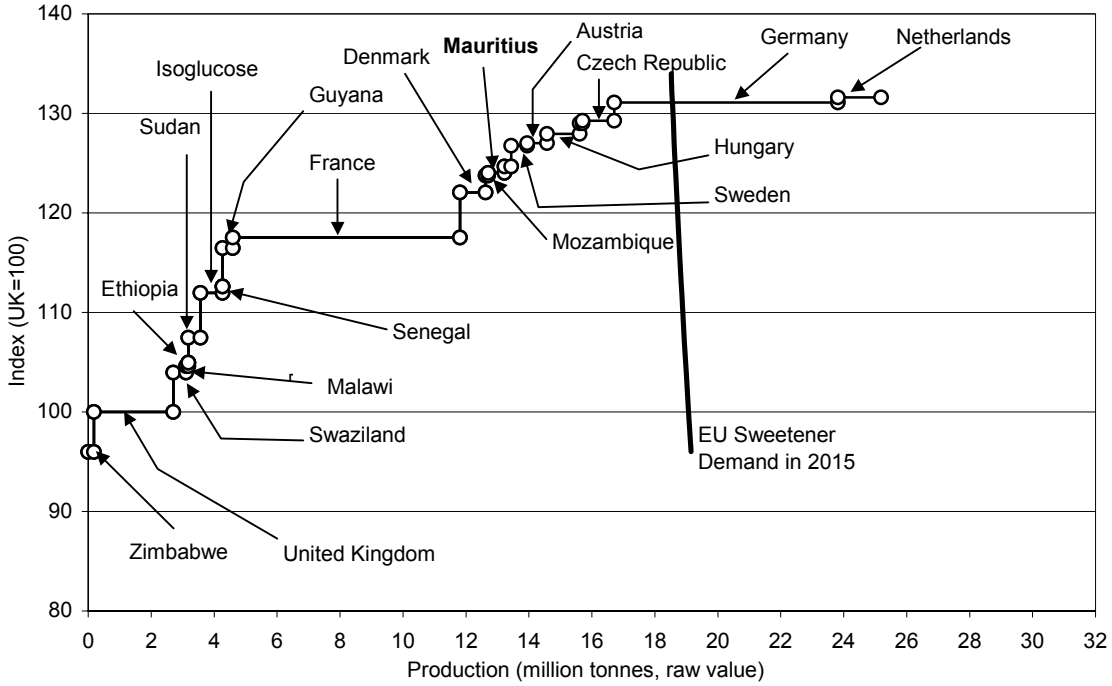
C. Mauritius will be a cost effective and competitive supplier on the EU market[5]

27. LMC, an authoritative source on sugar and sweeteners costs of production, has, after examining the elements of the Mauritian strategy, concluded that viewed in comparison with EU, ACP and LDC sugar and EU isoglucose suppliers, the cost of production of bulk raw sugar in Mauritius is currently too high to supply the EU market. However, with the implementation of the Action Plan, Mauritius would become a cost competitive supplier. This situation is illustrated by two diagrams given hereunder, the first one compares the supply costs, in the EU, of EU, ACP and LDC sugar suppliers and of isoglucose suppliers who are going to be constrained by the quota restrictions imposed

[4]Further details on the impact are at Chapter of Annex 1
[5] Further details on this issue are to be found in Chapters 3 and 5 of Annex 1

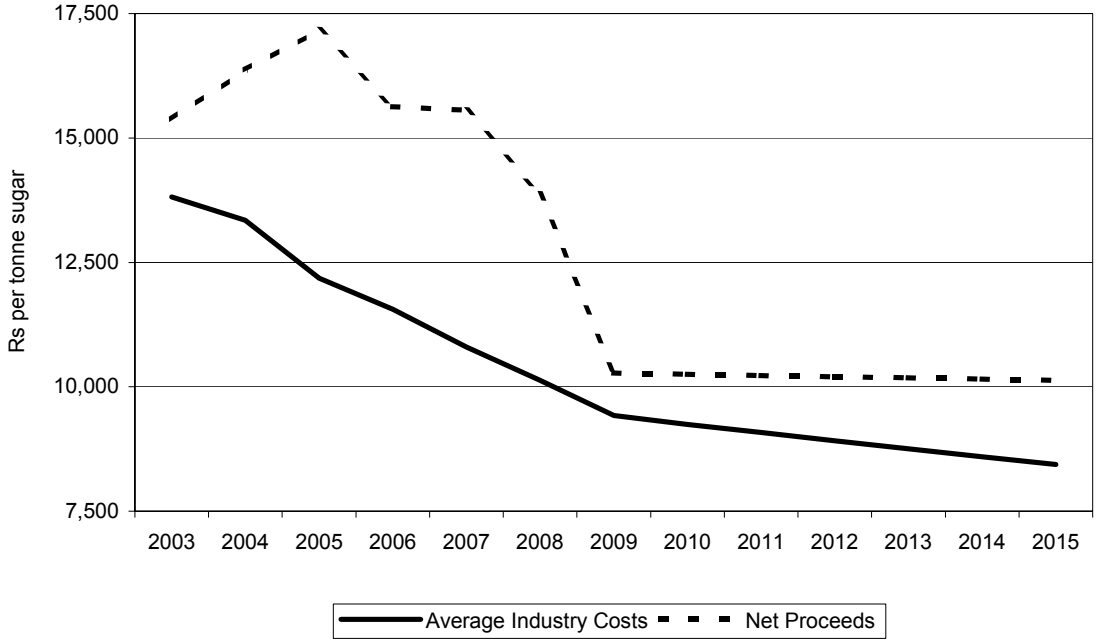
by the new Sugar Regime while the second one average industry cost of production with the ex-syndicate price. Diagram 2 shows that, **Mauritius is well within the cluster of cost competitive suppliers**, while Diagram 3 clearly indicates that the average **costs of production are lower than revenue under the current sales pattern[6] meaning that the industry is viable.** Both diagrams are drawn from the LMC report at Annex 1

Diagram 2: Potential Future Suppliers to the EU Sweetener Market



[6] Essentially raw sugar.

Diagram 3: Industry Costs versus Ex-Syndicate Prices



28. The competitiveness analysis has also been carried out on a segregated basis: millers, larger planters and small planters as well as on a regional basis. Diagrams 4, 5and 6, all drawn from the LMC report at Annex 1, illustrate the findings.

Diagram 4: Mill Costs versus Mill Share of Ex-Syndicate Prices

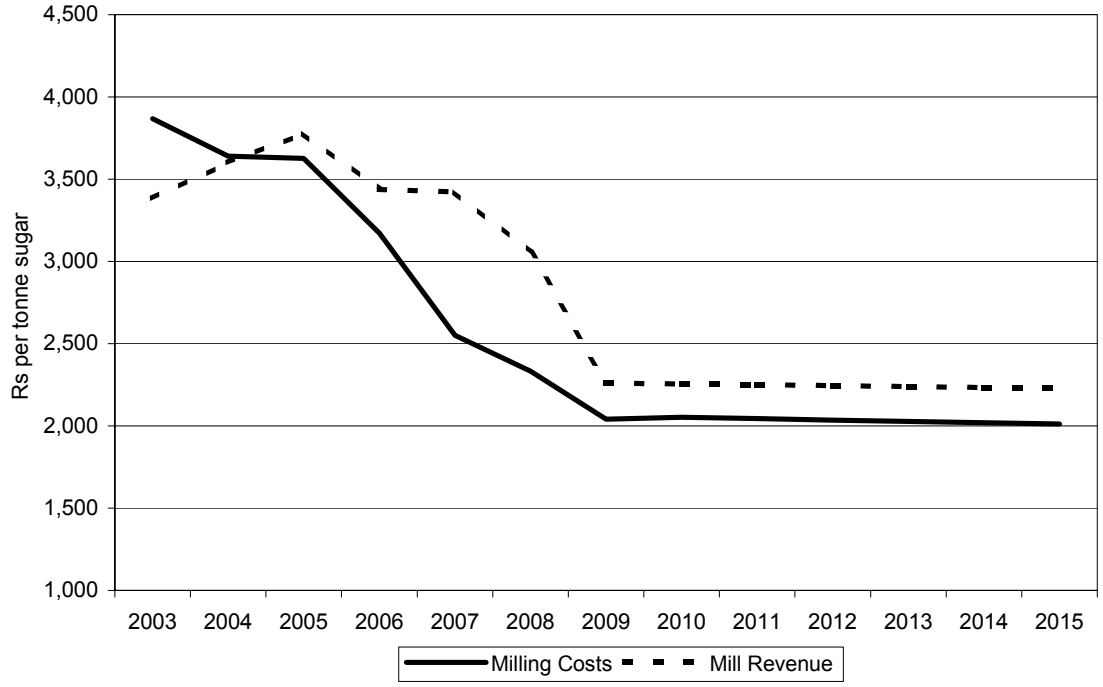


Diagram 5 : Estate and Smallgrower Costs versus Grower Share of Ex-Syndicate Prices

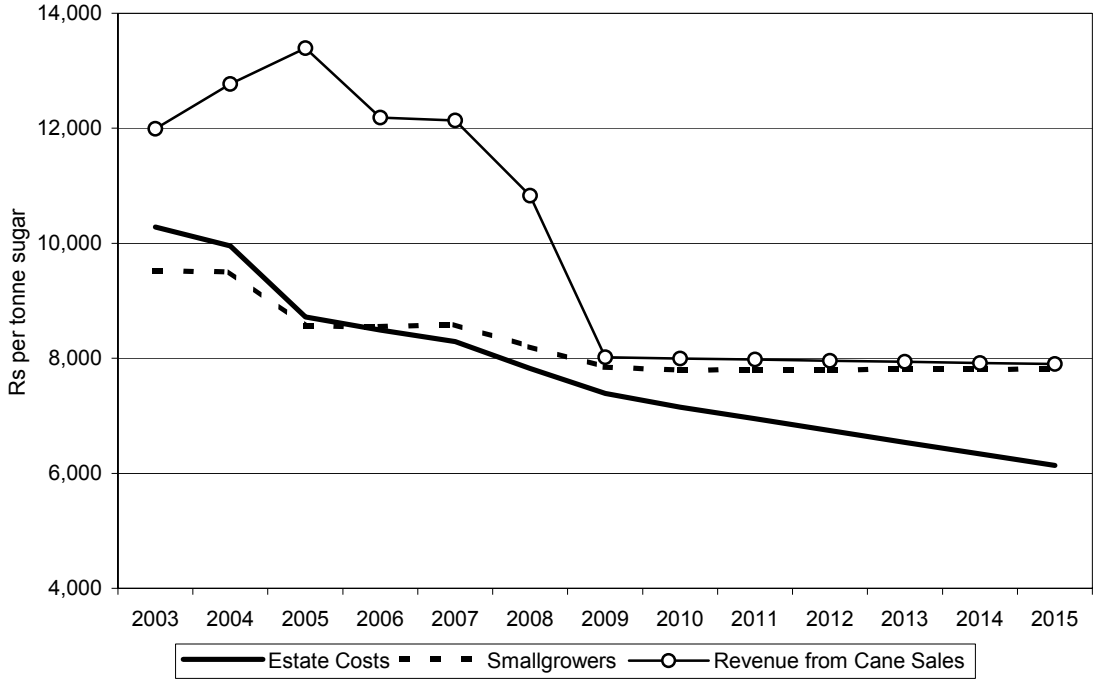
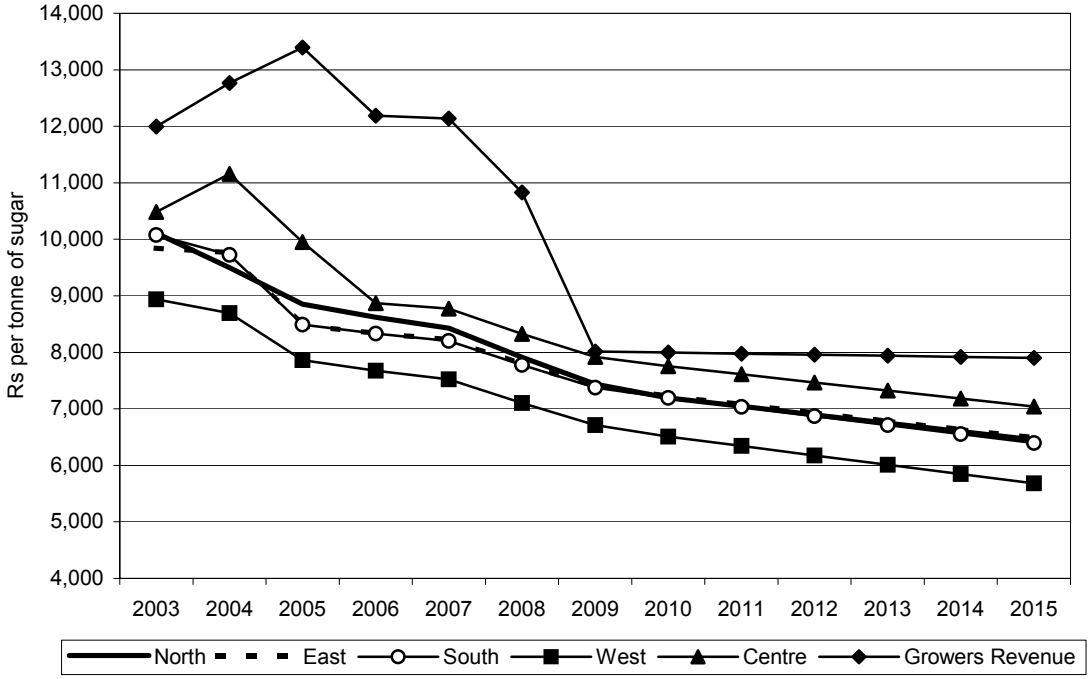


Diagram 6: Regional Costs versus Grower Share of Ex-Syndicate Prices



29. From diagrams 4 and 5, it is observed that all categories of producers will be able to survive if the Action Plan is implemented. The lowest margin is for small planters. The margin for all producers increases when all the revenue of the sugar cane cluster i.e sales of special, white and industrial sugars, net margins for electricity and ethanol and sales of molasses for the production of ethanol are taken into account. The latter adds on average Rs 200 per tonne of sugar[7]. Furthermore, it is to be noted that productivity gains through the introduction of new high sugar yielding varieties have been estimated on a conservative basis.

30. The regional analysis shows that the Centre, on account of its soil and climatic constraints, has the highest costs. However, all regions have costs lower than the ex-Syndicate price.

D. Features of the sugar sector and the uniqueness of Mauritius

D.1 Current status and role of the sector

D.1.1 Why sugar cane?

31. Sugar cane, through its considerable resistance and resilience to drought and more particularly to cyclones, has been the crop which has proved beyond doubt its capacity to be a viable crop on a long term commercial basis. Many other crops have been tried over time, through specific and often costly research and field testing programmes, but none has been able to adapt itself to Mauritian conditions**.** While diversifying its economy through the judicious use of the secure and predictable earnings derived from the Sugar Protocol , Mauritius has also adopted a "**diversification within sugar**" approach i.e. optimisation of the use of by-products; the production, to the extent possible, of value added sugars; food crops in cane interlines and cane rotational land.

32. Sugar cane is far more than a cash crop in Mauritius, in fact its multifunctional role in Mauritius is such that the country has no other alternative but to continue the cultivation of this crop. This role spans the economic, social, energy and environmental domains. Pour mémoire, the presence of this activity is critical for tourism and electricity generation and in a short while for the transport sector through the use of ethanol. It is also a key element in our food procurement strategy.

[7] Average price of molasses Rs750/tonne. For every tonne of sugar, 280 kg of molasses are produced, therefore Rs750 is equivalent to and additional revenue of Rs210/t of sugar.

D.1.2 Production and export data[8]

33. The average annual crop of 5.2 M tonnes of sugar cane are currently processed by 11 sugar factories, with factory throughput ranging from 200 000 to 800 000t canes, to produce some 575 000t of sugar, some 160 000 t molasses and some 1.8M tonnes of bagasse.

34. Sugar cane is cultivated across the island over some 72 000 ha i.e. some 40% of the island's area and 80 % of its arable lands. The cane is grown by some 28 000 planters with holdings ranging from more than 4000 ha to less than 0.1 ha. The vast majority of these planters are small holders. Some 20 000 persons are directly employed in this sector. In fact, 60 000 persons, one out of every three family in the rural areas, are directly or indirectly involved in the sugar industry.

35. Of the 575 000t of sugar, exports to the EU and the US under preferential arrangements amount to some 540 000t, whereas some 8000 tonnes of special sugars are sold to 23 world market destinations at world market prices plus a premium. The remainder of the production is available for local consumption. The bulk of local consumption is in the form of white sugar, two thirds of which is for direct use and one third for industrial use.

36. The bulk of the exports are under the Sugar Protocol, 507 000t, the Special Preferential Sugar Agreement (SPS), some 20 000t, while sales to the US under the Global Import Quota represent some 12 000t. The SPS quantities are expected to come to zero in 2009 with the unlimited access of LDC EBA sugars to the EU market. By then preferential commitments will amount to some 520 000 tonnes.

37. The sales to the EU under the Sugar Protocol are mainly in the form of raw sugar for refining, representing some 447 000t. The remaining 60 000t are sold in the form of special sugars, i.e. sugar destined for direct consumption, whose characteristics as natural ingredients and their special organoleptic qualities earn them a premium over and above the basic EU price. Sales under the SPS have to be in the form of raw sugar for refining, whereas raw and/or special sugars are exported to the US.

38. The basic price earned under the Sugar Protocol, currently at 523.7 euro/t raw is a cif price for the ACP. In fact, the net price for the ACP ex factory is significantly lower than 523.7 euro/t due to cost of inland transport, fobbing, insurance and freight.

39. Proceeds from the export of sugar amount to some 300M US$ per year on average, this enables the country to meet a very high proportion of its food import bill. Moreover, net export earnings from sugar account for more than 30% of such earnings from merchandise trade.

[8]Further details on the role of sugar cane in Mauritius are to be found in Chapter 2 of Annex 1

D.1.3 By Product use

40. Some 30 000t of molasses are used locally for animal feed and the production of potable alcohol. The remaining 120 000t are available for export or the production of ethanol.

41. At all times, sugar factories have through the combustion of bagasse (cane fibre) been self sufficient in terms of their energy needs for the manufacturing of sugar. The burning of bagasse generates steam at various levels of pressure depending on the characteristic of the boilers used. This steam goes to a turbo alternator where electricity is produced and low pressure steam extracted. Initially the totality of electricity and steam generated were used for sugar manufacture. It was then found that the energy saving and more efficient boilers could enable the production of electricity in excess of the requirements of the sugar factory and thus be available for export to the grid.

42. The first sales of electricity to the grid started as early as 1957 in Mauritius, and in this regard, the country has been a pioneer. Subsequently with improvements in energy and combustion technologies such sales soared. Currently some 300 GWh[9] are exported to the grid. Seven sugar factories use bagasse export only in the crop season. In addition three power plants, linked to sugar factories but operating under a separate legal entity, use coal and bagasse and export electricity throughout the year. Bagasse-derived electricity accounts for 18% of total island demand and coal and bagasse-derived units represent 45% of that demand.

43. The use of bagasse to produce electricity for sale to the grid avoids the import of some 200 000 t of coal. The adequate supply of steam and energy from bagasse for sugar manufacture also avoids the import of substantial amounts of coal. As a guide, some 60 kWh on an average are exported to the grid for every tonne of cane processed in the sugar factories of Mauritius. With the adoption of the most efficient technology currently available a figure of 130 kWh/tonne of cane in terms of export to the grid is being achieved.

44. It should also be recalled that of all cultivated crops sugarcane is known as the most efficient sequestrator of atmospheric carbon, and, as such, has global environmental benefits in line with the objectives of the Kyoto Protocol.

45. An energy audit carried out pursuant to the recommendations of the Sugar Sector Strategic Plan 2001-5 (SSSP) by an international and independent consultant has found out that the bagasse/coal option is definitely the cheapest in terms of base load electricity generation when compared to the coal and heavy fuel oil options. This cheaper cost of electricity is a plus point for the economy at large as electricity is an input in every economic activity.

46. The efforts to optimise use of bagasse and the coming into stream of more efficient plants are intimately linked to the centralisation (factory closure) process.

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[9] One GWh equals one million KWh

47. Optimisation, using existing state of the art technologies, of the biomass potential of the cane plant without affecting sugar production would for a cane yield of 100 tonnes/ha result in the export of 12 000 kWh of electricity (avoiding the use of some 7 tonnes of coal) and the production of some 750 litres of ethanol from molasses for blending in a 20/80 mix with gasoline (avoiding the use of some 750 litres of gasoline).

D.1.4 Food procurement

48. The import component in the case of sugar is very low and represents some 10-15% of the value of exports. Consequently, some 240-250M euros out of the 280M euros of export earnings derived from sales under the Sugar Protocol are net earnings. In current exchange rate terms, the net earnings are equivalent to some 65% of the food import bill in a country[10] that, apart from a few items, has to rely on imports for all of its food needs. If the export of molasses and the avoidance of coal imports are taken into account, the net export contribution of the sugar industry is further enhanced.

D.1.5 Partners of the industry and distribution aspects

49. The industry revolves along three main categories of partners, the corporate sector, the planters, essentially small ones, and employees. Whilst economic rationale presides over the running of the sugar industry, equity factors complement this rationale.

50. Government has always made efforts to ensure that the benefits of the country's preferential access to the EU filter down and are distributed among all stakeholders including workers, growers and their dependents and the population at large. This has been done in a number of ways

51. Planters are thus entitled to 78% of the sugar and to the totality of molasses accruing from their canes. Moreover, they are also entitled to revenue whenever bagasse is converted into electricity, thus some Rs 0.10 for every kWh generated from bagasse are credited to a common fund and then distributed to planters. This is the highest share of revenues received by growers in the world.

52. Employees are first and foremost guaranteed a permanent employment in what is basically a seasonal activity. The remuneration package is structured to enable the workers to secure a basic wage and a certain number of fringe benefits representing some 75% of the basic wage. Moreover, the industry provides a wide range of social benefits directly or through various institutions and organisations.

53. Most of the 28.000 planters and the 25.000 employees and a large number of employees who have retired are shareholders of a Sugar Investment Trust which holds 20% of the equity of all milling companies and between 10 to 20% of the equity of power companies.

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[10] Which is considered at the WTO as a Net Food Importing Developing Country.

D.1.6 Harmonious Rural development

54. The sugar industry has contributed significantly to social development and welfare on the island through its central role as a service provider to rural communities. This includes the provision of housing, healthcare, education and training, recreational facilities, technical and financial assistance.

55. Gainful employment for the employees and meaningful revenue for the planters, two categories which taken together represent one household out of three in rural areas, combined with the role of corporate sector in the rural areas are key instruments of the socio-political stability of the rural areas.

56. The availability of job opportunities in rural areas has shielded Mauritius from the scourge of a large number of developing countries, i.e. migration of rural people on account of poverty to form the slums of the urban areas. Moreover, the maintenance of some 50% of the population in the rural areas relieves the country from the problems of urbanisation in a situation where the population density, high by world standards, is 650 persons/km^2.

D.1.7 Protection and preservation of the environment

57. The contribution of the sugar industry to the protection and preservation of the environment is multi-fold, it relates *inter alia*, to soil conservation, biological control of pests, minimal use of pesticides, the discharge of a minimal pollution load, carbon sequestration, avoidance of imports of fossil fuels and maintenance of a green landscape.

58. Mauritius, an island state of some 1860 km^2 has a very fragile ecosystem. The critical factors are firstly, that the island is surrounded by a fragile coral reef barrier that protects its lagoon, its marine life and its sandy beaches and secondly, that the lands of Mauritius have a thin top soil layer. It is clear therefore that any disruption of the existing equilibrium through the absence of cane or large scale abandonment of cane could cause irreversible damage to the whole ecosystem, with far reaching implications on the environment, the fishing sector, the tourism industry and the economy at large.

59. Sugar cane covers more than 40 per cent of the island's surface area to which it provides protection against the vagaries of the weather. After more than three and half centuries of cultivation, it constitutes a homogeneous and stable stratum within which equilibrium has been achieved. Sugar cane cultivation enables the establishment of a permanent cover throughout the year protecting against soil erosion while maintaining moisture and increasing organic matter content.

60. Sugarcane cultivation and processing has a relatively low negative impact on the environment (and indeed several beneficial impacts) in comparison to other land-uses, and can therefore contribute to environmental protection. For instance, it uses relatively low doses of agro-chemicals, through inter-alia recourse to biological control, breeding and adoption of cane varieties resistant to pests and diseases, in comparison to other

tropical crops such as fruit and vegetables; it is wind resistant and its strong root system binds the soil. Being a perennial crop, it maintains the soil structure untouched for several successive years and is thus a very effective in controlling soil erosion. Modern processing methods have been adopted resulting in a very clean and efficient industry in comparison to other industries, with a range of cost-effective options for recycling and re-using waste streams.

61. If sugarcane were to be replaced with a less stable crop in the steeply sloped marginal areas, then soil erosion and subsequent sedimentation and/or eutrophication problems may occur in downstream reservoirs or lagoons, as nutrients are washed off in top-soils. The same conditions would occur if more agro-chemically intensive crops such as fruits and vegetables were grown instead.

62. The environmental life-cycle benefits of sugar cane are significant, in that almost all of the by-products and waste streams are utilised in some way or other in an environment friendly manner, e.g. bagasse/cane trash for power generation, filter cake/combustion ash as a soil conditioner, molasses as livestock feed ingredient or for the production of bio-fuel, vinasse for fertigation, composted or concentrated vinasse as an organic fertiliser etc.

63. Sugarcane is also associated with aesthetic benefits, for example in the greening of islands such as Mauritius for tourism. It has to be pointed out that cane cultivation is maintained in certain areas of Hawaii for the specific purpose of ensuring greenery for the tourism industry. Thus the sugar industry provides two key assets to tourism: a green landscape and avoidance of pollution of lagoons through soil erosion.

64. With regards to sugarcane cultivation, the only significant impact on air quality arises from the burning of cane prior to harvest. In addition to the global impacts of such practices, the localised particulate emission from cane burning can be significant when wind conditions are unfavourable. In response, the industry has recently introduced its own code of practice with regard to the burning of cane:

(i) Cane burning will only be carried out at night.

(ii) The practice of ‘cool burning’ has been introduced and will be extended to a large scale to reduce particulate matter emissions.

(iii) Cane plots alongside public roads will be avoided.

(iv) Sensitive geographical i.e. residential and tourist areas will be avoided.

(v) Burning will not be carried out at weekends, public holidays or during religious festivals in the vicinity of built-up areas.

(vi) Burning will be avoided wherever mechanical harvesting of green cane is possible.

65. It should be noted that cane burning cannot be practiced on the whole area under cane in Mauritius. Cane will simply not burn in the superhumid zone and in parts of the humid zone. Not all growers resort to burning in areas where it can be practiced. Most importantly it must be stressed that through the various actions taken in the recent years, the area under cane which is actually burnt, has decreased from 35 to 15 % which is quite an achievement. Further reduction will occur in the coming years as area mechanically harvested presently at 15 000 ha will inevitably be extended to some 25000 ha which would have undergone proper land planning required for full mechanization.

66. Following a Global Environment Facility funded Characterisation of sugar industry waste study, norms have been established to minimise the pollution load of the industry and the industry is complying therewith. The lower use of chemicals and the minimal pollution load policy have also to be viewed against the fact that about 60 per cent of the domestic water consumption in Mauritius comes from underground water.

D.1.8 Price of sugar on the local market

67. Domestic sugar prices have been kept very low for the benefit of consumers. For example, in 2004, the white sugar price for sugar sold to wholesalers was around 70% of the world white sugar price (c.i.f. basis). Currently, the percentage stands at 35%.

D.1.9 Services

68. Sugar earnings are used to fund, *inter alia*, cane testing, marketing, research, crop insurance**,** storage, farm's extension services and input subsidies. The funds required for these purposes and the premium payable for insurance amount to some 16% of sugar proceeds. In developed countries, such funds emanate from national and other budgets.

69. The sugar industry is also closely linked to the services sector, one example being the transport sector, yearly more than 6 million tonnes of goods, sugar, cane, molasses, fertilisers, scums, construction material are transported in respect of the inputs and outputs of this industry.

D.2 Constraints of the Sugar Industry

70. Currently, the industry is saddled with the following problems:

(i) **Limits to expansion of production**: the inability to increase production through an extension of cultivated areas;

(ii) the absence of economies of scale in the operations of small planters representing some 25% of cane production, this results in lower yields and higher costs of production;

(iii) the size of most of the sugar factories in operation precludes the full use of economies of scale; currently mills produce between 20 000 to 85,000 tonnes of sugar when mill output in competitive countries is in excess of 100 000 tonnes;

(iv) a higher than needed labour force which in addition is employed on a permanent basis in an activity which worldwide relies and employs seasonal labour; labour costs account for some 50% of total costs;

(v) the use of by-products molasses and bagasse (cane fibre) is not optimized; no ethanol is produced from molasses and 300 million kWh, as compared to a potential of 600 million kWh are exported to the grid from bagasse;

(vi) the proportion of value-added sugars in total exports is only 15%;

(vii) producers through sales of sugar to the local market at low prices lose on average some 7.5M€ yearly;

(viii) the level of indebtedness in the corporate sector as a result of the implementation of the 2001-05 Sugar Sector Strategic Plan, and factory closure is high and would act as a constraint to operators wishing to engage in reform;

(ix) the dearth of financial and technical resources at small planter level is a major constraint to their regrouping into larger units, proceeding to mechanization and investing in irrigation;

(x) regulations on cane and cane juice use act as constraints to the full development of the cane cluster;

(xi) some institutions servicing the sugar industry are overmanned and costly;

(xii) synergies between the various stakeholders of the industry are not optimized.

71. These constraints unless adequately addressed will prevent the proposed sugarcane cluster from being competitive, viable and sustainable in the long term.

D.3 Conditions conducive to the implementation of a successful plan

72. On the condition that adequate financial resources are available, Mauritius can successfully implement the Action Plan by taking advantage of the following factors:

(i) the commitment of Government and of all stakeholders to undertake deep and bold reform;

(ii) the experience acquired over the past twenty years in implementing reform;

(iii) the reform of the sugar sector is part of an overall economic strategy destined to revitalise the economy;

(iv) the labour rightsizing plans are socially acceptable and can lead to significant cost reduction;

(v) there is significant scope to benefit from economies of scale at both field and factory levels;

(vi) the expected gains in cane productivity from small planters fields are substantial;

(vii) land preparation costs can be reduced through the sale of rocks to stone crushers within the limits of demand triggered by the pace of economic growth;

(viii) the use of bagasse/coal to produce electricity is more economical than the use of heavy fuel oil, moreover, the full potential of bagasse and some factories of cane biomass are yet to be tapped;

(ix) the high price of fossil fuels, oil in particular provides an opportunity to optimize by-products in particular for the production of ethanol;

(x) the reduction of cess and the increase in the price of sugar on the local market do provide avenues to enhance the revenue of producers;

(xi) Mauritius has a good track record in terms of the production and supply of direct consumption sugars and can increase the percentage of such sugars in total exports through bold, innovative and aggressive marketing strategies.

E. Consultation with stakeholders and the preparation and validation of a consensus multi-annual strategy

73. In the context of the review of the 2001-2005 Sugar Sector Strategic Plan and the preparation of a multi-annual adaptation strategy for the Sugar Industry, Government held intensive consultations with all stakeholders of the industry.

74. Initially, the stakeholders made written submissions to Government. Subsequently, a dialogue process was established on the principle of a bottom-up approach purporting to achieve consensus and the full ownership of the strategy by all stakeholders. Government also made arrangements for the free and frank interaction

between all stakeholders and a fact finding mission of the Development Commission of the European Parliament.

75. A strategy was evolved by Government, with projects and cost estimates Given that Mauritius has to use its plan for negotiations with the EU and that global competitiveness considerations have to be factored in the formulation of policy, it was decided that it would be appropriate to have the plan scrutinised by reputable consultants having wide international knowledge of cost of production issues and sustainability appraisal exercises.

76. Landell Mills International (LMC), recognised worldwide as the authority on cost of production matters, was chosen for this scrutiny. In November 2004, the Mauritius Sugar Authority contracted LMC International to lead a team of experts, including the environmental consultancy firm ERM (Environmental Resources Management) and the firm of Chartered Accountants BDO De Chazal du Mée, for a scrutiny study.

77. The primary objectives of the study were:

(i) to validate the plan from a social, environmental, economic and financial perspective;

(ii) to determine whether the accelerated reform proposals are sufficient to ensure a sustainable future for the sector; and

(iii) to identify the industry's future funding requirements.

78. The novelty of this study was the conduct of a *Sustainability Appraisal* of the sugarcane cluster. This type of appraisal aims at predicting and assessing the economic, social and environmental effects that are likely to arise from a plan, or a series of events (such as those contained in the action plan for the sugarcane cluster). The appraisal integrates two processes namely *Sustainability Appraisal* and *Strategic Environmental Assessment*.

79. In its task LMC had extensive consultations with the various stakeholders of the industry and took on board the contents of the Working document of the Commission on the Action Plan on accompanying measures for Sugar Protocol countries affected by the reform of the EU sugar regime.

80. LMC submitted its report in March 2005 and on this basis two documents were prepared namely the Accelerated Action Plan 2005-2015 and the Road Map and both were submitted to the European Commission. Subsequently, the report of LMC and its annexes were submitted to the Commission.

81. The task force was provided with relevant information and Commission guidelines on Sugar Accompanying Measures by the Delegation and this facilitated the preparation of the Action Plan. A very constructive dialogue has been engaged between

the task force set up by the Deputy Prime Minister, Minister of Finance and Economic Development in consultation with the Minister of Agro-industry and representatives of the Delegation and this has facilitated the understanding on both sides.

82. Several developments have taken place since March 2005 warranting a review of the multi annual adaptation Strategy then termed Accelerated Action Plan 2005-2015, namely:

(i) The quantum of the EU-market sugar price cuts and its phasing in over time in the EU is now known; initially, the analysis was based on several hypotheses of price cuts and a sweetener equilibrium price;

(ii) The impact of the reform of the Sugar Regime on the market environment in the EU and in particular the seller/buyer relationship;

(iii) A fair assessment of the amount of accompanying measures that will be proposed to Mauritius by the EU can now be made and the schedule of disbursements of the funds is also clearer;

(iv) The moves being made by big EU sugar players to invest in the low cost ACP and LDC countries eventually leading to a vertical integration of low cost producing countries by EU sugar multinationals;

(v) The significant and sustained rise of oil prices and more importantly the inevitable further rise of these prices;

(vi) The need to update the exchange rates that were used in the first LMC study. Then the rupee equivalent of the $ and the € were taken as Rs28.00 and Rs33.00 respectively. These are now Rs30.00 and Rs36.00 respectively;

(vii) The evolution in the approach towards the closure of factories in particular the formation of regional milling company;

(viii) The field experience in respect of the regrouping of planters and the implementation of Voluntary Retirement Scheme;

(ix) The measures to facilitate the conversion of land of planters owning less than one ha, such a measure having an impact on the level of production;

(x) The need to revisit the schemes in respect of difficult areas.

83. LMC has been contacted to update its March 2005 report in the light of the new elements referred to in the above paragraph.

84. The Action Plan 2006-2015 has been prepared on the basis of the updated LMC report, the elements detailed above as well as the criteria and guidelines spelt out in the Working document of the Commission on the Action Plan on accompanying measures for Sugar Protocol countries affected by the reform of the EU sugar regime of January 2005. Regarding the latter, particular consideration has been given to the essential principles for successful adaptation strategies, the key points for undertaking a sustainability analysis, the strategy at entrepreneutial sector level and the different lines of action that have to be undertaken by the public sector.

85. The updated LMC Report which is a comprehensive description and analysis of the Mauritian sugar industry past, present and future is at Annex 1.

F. The general achievable objectives and the projects of the Action Plan

F.1 Market Environment

86. The reform of the EU Sugar Regime in terms of price reduction, seller/buyer relationships and corporate merger and acquisition strategies as well as the inevitable rise of oil prices will bring about a significant change in the market environment. The Action Plan has duly taken into account these critical elements. In more specific terms, the following has been considered:

(i) the substantial price reduction of the cif price by 36%;

(ii) the negotiations on Economic Partnership Agreements pursuant to the Cotonou Agreement;

(iii) the new opportunities that could enable the sale of significantly larger amounts of value-added direct consumption sugars i.e. special ,industrial and white sugars;

(iv) the changed seller/buyer relationship;

(v) the EBA initiative , in particular the entry as from 2009 of duty and quota free exports from low cost and competitive LDC suppliers;

(vi) the possible vertical integration of low cost ACP/LDC producers by EU sugar multinationals which could not only enhance the competitiveness of the former but also provide them with privileged buyers in the EU market;

(vii) the inevitable rise in the price of oil;

(viii) the cost of electricity produced from bagasse and coal being more economical than from heavy fuel oil;

(ix) the attractiveness of ethanol production from molasses at certain levels of oil and molasses world prices: production of ethanol from cane juice is feasible if the oil prices are significantly and sustainability higher than 80 $ per barrel.

F.2 Overall Objectives

87. The formulation of the overall objectives is based on the fact that the furtherance of the multifunctional role of the cane industry and the optimal tapping of its energy potential can only be achieved if the cane and sugar activities, indeed the core businesses, are viable and sustainable. In this context, the analysis of the market environment leads to the following overall objectives:

(i) the transformation of the sugar industry into a **sugar cane cluster**; this transformation means that the industry moves from an essentially raw sugar producer to a situation where it produces several types of sugar i.e. raw, special ,industrial and white; electricity from bagasse/coal using state of the art technology and ethanol using molasses;

(ii) the establishment of a competitive, viable and sustainable sector;

(iii) the fulfillment of the trade commitments of the country;

(iv) the reduction of the dependency on the import of fossil fuels generally and on oil in particular;

(v) the continuation of the multifunctional role of sugar and in particular the support to national environment and social objectives.

F.3 The components of the Action Plan

88. The Action Plan is made up of projects for which funding would be sought as well as elements which depend on Government and Producer intervention. Accordingly, the Action Plan is articulated along components and subcomponents destined to respond to the new market environment and address the constraints of the sugar industry namely:

(i) **cost reduction:**

(a) the closure of seven out of the existing eleven factories whereby three of the remaining four would produce more than 100,000 tonnes of sugar;

(b) the rightsizing of human resources in production entities to reduce the level of labour costs both in absolute and relative terms;

(c) the facilitation of recourse to seasonal labour;

(d) the substantial reduction of overhead costs at operational, administrative and institutional levels;

(e) the reduction of the level of indebtedness to bring down financial charges; this reduction also increases the bankability of the sugar producers;

(f) the derivation of full benefits from economies of scale at all levels, corporate sector and small and medium planters;

(ii) **additional revenue:**

(a) sales of a higher proportion of value added direct consumption sugars i.e. moving from the current 15% of total sales to 50% or more through a bold, innovative and aggressive marketing strategy;

(b) eliminating the loss incurred by producers on sugar sold on the domestic market;

(c) reducing the cost of the institutions servicing the sugar industry by 50%;

(d) higher sugar output through the cultivation of high sucrose cane varieties;

(e) earnings secured through the optimization of by-products**.**

(iii) **optimal use of by-products:**

(a) increase electricity production from bagasse from 300 to 600 GWh and total electricity production from bagasse/coal from 750 GWh to 1700 GWh;

(b) producing 30 M litres of ethanol from molasses so as to allow a 20/80 ethanol/gasoline blend;

(c) depending on oil prices and the ethanol/gasoline mix, producing ethanol from cane juice;

(d) fostering research to obtain and commercially use higher fibre cane and even fuel canes, the fibre content of the latter can reach 50%;

(iv) **the pro poor dimension:**

(a) the provision of an attractive cash and in kind compensation for employees accepting the voluntary termination of their contract of employment in the context of factory closures or rightsizing of growing and factory entities; the package includes the possibility to benefit from early entitlements to the retirement pension;

(b) the provision of re-skilling opportunities and loan opportunities to these employees;

(c) the provision of significant incentives and assistance to small planters to enable them to regroup into larger units and thereby increase their yields and lower their cost of production;

(d) the provision of support to planters operating in economically and environmentally difficult areas;

(e) the provision of a decent compensation package to employees working in services providing institutions that will be rightsized;

(f) the participation of the employees having voluntarily terminated their contract of employment in empowerment and welfare schemes being set up by Government.

(v) **debt alleviation**: measures to address the problems posed by the current indebtedness;

(vi) **adapting regulation:** removal of regulatory constraints in respect of the use of cane and cane juice;

(vii) **synergies:**

(a) the fostering of cane cultivation agreements between millers and planters to ensure an adequate supply of canes to the former and remove the sugar loss constraints faced by the latter;

(b) enhanced participation in equity.

F.4 Future sugar production

89. As pointed out above, the preferential commitments under the Sugar Protocol and the US global import quota would total some 520 000 tonnes. Currently, the production potential of Mauritius is some 575 000 tonnes produced on some 72 000 hectares. Land under cane is expected to go down to some 63 000 hectares on account of several reasons:

(i) Conversion of agricultural land to non agricultural use by the corporate sector, large and medium planters, the Sugar Investment Trust and the State Land Development Company;

(ii) Small planters owning less than one ha can convert their agricultural land to non agricultural use, without payment of any land tax, if the land is situated in areas where such conversion is permissible;

(iii) Abandonment of production in very marginal and economically and environmentally difficult areas.

90. Cane yields are however expected to go up for several reasons:

(i) increased access to irrigation and better cultural practices;

(ii) use of higher cane yielding varieties and/or ones with higher sucrose content but gains in this regard could be mitigated by losses resulting from the more extensive use of mechanical harvesting;

(iii) increased cane and sugar yields of small planters having regrouped themselves to benefit from better cultural practices and economies of scale.

91. As a consequence of these developments, total area under cultivation is estimated to go down to some 63 000 ha and cane production would move from 5.2 M tonnes to 4.75 M tonnes. The processing of the latter cane output would result in a sugar production of 520 000 t. the details regarding these figures are to be found in chapter 5 of Annex 1.

92. The reduction in area under cane is expected to be gradual over the 2006-2015 period. In this regard, it has to be recalled that land conversion is by no means an easy and straight forward process. Indeed, conversion depends on market demand for land as evidenced by the difficulties encountered by sugar producers for the sale of land to recoup costs incurred in the implementation of the Voluntary Retirement Scheme. Cane abandonment can be slowed down through regrouping.

F.5 The Sugar Cane Cluster

93. The centrepiece of the Action Plan is the establishment of the sugar cane cluster made up of **sub-clusters** which would be operational around the remaining four sugar factories. The success of the cluster rests on a few critical factors given hereunder in descending order of importance:

(i) a very efficient and sizeable mill; the mill being the seat of value creation and addition in that the cane plant will be converted to a host of value-added products;

(ii) the adequate provision of energy in the form of steam and electricity;

(iii) a reliable and sustainable supply of canes, while, in spite of the cost issues that still need to be addressed, the large producers are expected to have a more or less stable production, in the case of medium and small planters innovative measures have to be put in place to ensure the viability of plantations as well limit the loss of production;

(iv) efficient and flexible state-of-the-art installations to produce different types of sugar and to optimize the use of bagasse, molasses and eventually cane juice;

(v) further strengthening of the commonality of interests between the other stakeholders and the millers through establishment of cane cultivation/harvest arrangements between planters and millers and appropriate participation in equity.

94. From the physical and practical perspectives, the following is relevant in respect of the sub-clusters:

(i) The setting up wherever possible of factories that can produce more than 100 000 tonnes of sugar: raw, specials, industrial and white sugars;

(ii) The erection of firm bagasse/coal power plants using high pressure boilers to export electricity to the grid wherever such set ups do not exist;

(iii) The installation of ethanol distilleries of 30 million litres annual production capacity that would initially process molasses but could also eventually treat cane juice;

(iv) The possibility to produce any type of sugar and to shift from sugar to ethanol production whenever required i.e. **the concept of a flexifactory**;

(v) The reassessment and restructuring of the products supply chain from factory to shipment, including the possible installation of packing, packaging and container facilities in the context of the marketing strategy being worked out by the Mauritius Sugar Syndicate in consultation with the MSA; such installation/facilities, while enabling local value addition, establish a direct link between buyers and sellers and can facilitate strategic market alliances between Mauritian companies and EU buyers;

(vi) The possible installation of a dry cane cleaning plant, such a plant allows the separation of leaves and trash from the cane stalk, the milling of the cleaned canes improves sugar recovery and lower energy consumption in milling while the separated leaves and trash provide additional combustible to generate electricity;

(vii) The possibility of producing Rhum Agricole from cane juice taken straight from the mill; this is a very high value-added product which additionally will further enhance the brand image of Mauritius as a sugarcane haven;

(viii) The introduction of voluntary and negotiated **cane cultivation agreements** between planters and the mill where the latter would in consultation with the former organize the cultivation and harvest of canes, the idea being to move to a situation where the miller would buy **standing canes from the planters**; this could also encourage the establishment of a number of small and medium specialized service providing entities with the resulting sustainable employment creation. In addition it will have positive impact on the sucrose content of cane which will be harvested at peak maturity.

(ix) The fostering of a **new equity mix** following negotiations conducted among the parties concerned.

(x) The new mix and the cane cultivation agreements will consolidate the partnership of the stakeholders in the industry to enable the mill to have adequate raw material operate at maximum efficiency and **to ensure that all concerned have a fair return in the very difficult context of substantial price decreases**.

F.6 Projects of the Action Plan

F.6.1 Project 1: Field Operations and the regrouping of planters

F.6.1.1 The project

95. The complete detailed analysis of the various projects of the Action Plan is to be found in the Section termed Projects of Annex 1 Field operations and regrouping of planters are given as Project 1 of this Annex.

96. Project 1, Field Operations and regrouping of planters, can be summarised as follows:

(i) Its objectives are to improve the cost competitiveness of the field sector and to ensure the **sustainable and reliable supply of canes by small planters** through regrouping. Small planters, i.e. those cultivating less than 10 hectares, currently cultivate some 26% of land under cane, this percentage will come down as a result of land conversion and cane abandonment but this category of producers will still cultivate some 20 % of the total area under cane.

(ii) The key to unlocking future productivity gains is the de-rocking of cane lands as it will:
   (a) Enable the expansion of cane area under irrigation.
   (b) Increase the proportion of the cane area that is cultivated and harvested mechanically.
   (c) facilitate the regrouping of small and medium planters and enable the introduction of partial mechanization i.e. application of fertilizers, herbicides and cane loading.

(iii) Along with the rightsizing of the labour force through the second wave of the Voluntary Retirement Scheme, termed VRS II, Project 1 is expected to play an important role in reducing field cost of production in Mauritius over the next decade. These benefits will accrue primarily to estates and large growers but also to small planters if they fully participate in the regrouping exercise.

(iv) The financial costs of the project are estimated at Rs 3.5 billion. While the project as a whole offers an attractive rate of return of approximately 42% attributable principally to the benefits associated with mechanisation of field operations. Neither de-rocking nor irrigation offers a positive return.

(v) To date, re-grouping has not been very successful, and incentives and more importantly a new approach to land management has to be adopted. The conclusion of cane cultivation agreements involving the planters, the institutions and the millers is the way forward.

(vi) De-rocking, re-grouping, irrigation and mechanisation will have positive environmental consequences. Re-grouping, for example, allows improved soil conservation practices to be introduced, while stone crushing provides aggregates for the construction industry, reducing the need for quarrying elsewhere.

F.6.1.2 Facts and figures

97. Table 2 gives the current and future parameters regarding the field sector after taking into account the specific circumstances of the country i.e a volcanic island with a high level of rockiness.

Table 2: Current and Future Field Sector parameters

	Mauritius		Estate/Planters		Smallgrowers	
	2003	**2015**	**2003**	**2015**	**2003**	**2015**
Area Under Cane (000 ha)	73	63	50	46	23	17
- Rock-free (%)(1)	50%	81%	54%	84%	42%	74%

- Irrigated (%)	29%	49%	32%	46%	23%	57%
Area Harvested (000 ha)	70	61	48	44	22	17
- Fully Mechanised (%)	21%	55%	30%	74%	0%	5%
- Semi Mechanised (%)(2)	49%	27%	64%	20%	17%	47%
- Manual (%)	30%	17%	6%	6%	83%	48%
Mechanised Field Operations						
- Planting (%)	2%	15%	3%	20%	0%	0%
- Fertiliser Application (%)	24%	69%	35%	88%	0%	20%
- Herbicide Application (%)	20%	69%	29%	88%	0%	20%

Notes: 1. Rock-free = derocked and free soils.
2. Semi mechanised = manual harvesting + mechanical loading.
Source: LMC

98. The table shows that the corporate sector engaged ever since the seventies to prepare their land for mechanisation will have proceeded to a high level of complete mechanisation of cultural operations. On the other hand, the small planters will have progressed but more in terms of partial mechanization. This is understandable as complete derocking , the prerequisite for full mechanisation, is a very lengthy and costly process which in addition is dependent upon the demand by the construction and civil works activities.

99. Initially it was envisaged to irrigate some 10 000 hectares over the 2006-2015 period, however, the new circumstances relating to land conversion by small planters and the limitations to derocking, it is considered that only 7000 ha would be irrigated.

F.6.1.3 Regrouping of planters[11]

100. Table 3 shows the distribution of planters, ranging from the very small ones to the corporate sector, on an acreage basis as computed by the Sugar Insurance Fund.

Table 3: Distribution of planters in terms of acreage brackets

Acreage Group	Number of Planters	Production as a % of total
0 to 0.5 hectares	15400	4.6
0.5 to 1.0 hectares	7000	6.1
1.0 to 2.0 hectares	3700	6.1
2.0 to 5.0 hectares	1900	6.6
5.0 to 10.0 hectares	350	2.9
10.0 to 25.0 hectares	105	1.7

[11] Details on this project are at Project 1 of Annex 1.

25.0 to 50.0 hectares	20	0.7
50 hectares plus	68	71.4

Source: Sugar Insurance Fund

101. Not all of the small planters are expected to stay in business. Two policy options exist for them. Firstly, regrouping where the conditions for regrouping and productivity gains are met and secondly, incentives to convert land where the land of small planters is found in areas where conversion to non agricultural use is possible. In both cases incentive packages have been worked out, those on regrouping are given below. Regarding land conversion planters cultivating less than one hectare at a specified date are exempted from the payment of all land taxes. It is expected that some 3000 hectares of land would be converted to non agricultural use. But as indicated earlier in Section F.4, land conversion would be gradual and move with market demand.

102. The sustainability of the small planters (cultivating 10 hectares or less) and the reliability of the supply of their canes hold the key to the future viability of the sugar cane cluster. Indeed, unreliability of cane supply is an impediment to investments and impacts negatively on profitability**.** However, this category of producers face a certain number of adverse factors which would have to be adequately addressed

(i) land is neither prepared for mechanisation i.e. partial/complete nor is it ready to benefit from economies of scale;

(ii) canes are not always harvested at the optimal time resulting in lower sucrose content; moreover, canes may have been harvested in time but transport logistics and cane quotas lead to an undue delay between cane harvesting and milling again leading to sugar loss, thus some 10 kilogrammes of sugar can be lost implying a loss of Rs 133 /tonne of cane in today's terms or Rs 85 at a 36 % price reduction;

(iii) cutting, loading and transport of canes to the mill is costly because of diseconomies of scale and is also a major hassle for small planters and is a factor contributing to their intent to abandon their plantations;

103. Regrouping of planters into larger units and the conclusion of cane cultivation agreements with managers who have the appropriate expertise in the management of plantations will adequately address the constraints currently faced by the planters.

104. Operation in large units coupled with efficient management would after derocking, even the coarse one, mean 2-3 % extra land to cultivate, at least 10-15 % increase in cane yield due to better varieties and cultural practices and at least 5-7% increase in sugar recovery on account of timely harvest and delivery of canes to the mills. Overall sugar yield per unit area would thus be improved by 1at least 18 to 27 %, **20% on a conservative basis** . On the other hand, production costs can be reduced by at least some **20-25%.** This approach is therefore a fitting response to the substantial price reductions provided the management of plantations is done in a more professional

manner which is precisely what the corporate sector and key institutions working in close collaboration can achieve.

105. The implementation of the regrouping project started in October 2005 and after 6 months, numerous lessons have been drawn regarding the management of the project, the extent of land and the category of planters to be covered, the implementation rate having due regard to the constraints of stone crushers and the incentives to be given. In this regard, the following is relevant:

(i) Regrouping should start in those areas posing the least difficulties in terms of rockiness i.e. free soils and soils with a low level of rocks, in such cases land preparation through coarse and fine derocking should be geared to accommodate the highest level of mechanisation possible;

(ii) In cases of medium rockiness, land preparation should stop at coarse derocking and only mechanical loading should be targeted;

(iii) In cases of high or very high rockiness options of land conversion and the cultivation of other crops should be envisaged;

(iv) The undertaking of the project over a lesser extent, 12 000 ha, and for a longer time, 10 years, will enable a better matching of derocking with the demand of stone crushers. The involvement of stone crushers and the carting away of the rocks by them contribute significantly to reduce the cost of coarse derocking or even meeting the full cost;

(v) The management of the regrouped units would best be done by the millers in collaboration with specialized institutions of the sugar sector namely the FSC, the MSIRI, the SPMPC and the MSA; this approach addresses the constraints of both the miller and the planter;

(vi) the capital expenditure part of the irrigation project would, as in the past, be effected through the Irrigation Authority with no cost to the planters serviced by this institution;

(vii) The cost of fine derocking, an average of Rs70 000 per hectare, would be borne by Government via accompanying measures for small planters. With respect to medium planters, Government through the accompanying measures will fund 50% of the cost;

(viii) Cane setts will be provided free of charge to the planters through the Farmers Services Corporation;

(ix) The Sugar Planters Mechanical Pool Corporation will wherever appropriate benefit from grants to acquire equipment;

(x) Private operators, in particular SMEs, and stone crushers will benefit from cheap finance to equip themselves;

(xi) The project is expected to cover some 12 000 hectares and will include small and medium planters;

(xii) The project would span a period of 10 years starting in 2006.

106. On this basis the total cost of derocking would be Rs 1.3 billion. The cost estimates for field operations initially included Rs1.9bn for irrigation and Rs0.9bn for mechanical harvesting and mechanization of field operations. The reduction of the acreage to be irrigated brings the first figure to Rs 1.3 bn. Irrigation projects have so far been funded by bilateral loans or Government resources. In the difficult budgetary situation the latter approach will be revisited. As a result of the above modifications to, project one would cost Rs 3.5 bn.

107. Only the part relating to derocking and that part of the investment requirements of the irrigation projects covering small planters would be funded from accompanying measures or other sources of concessionary finance.

108. The regrouping project does not only fulfill an economic goal i.e. ensuring the viability of the sugar cane cluster but it equally ensures that one major vulnerable partner, the small planter, remains in business and continues to derive meaningful revenue from the cluster. This is a vivid example of the integration of the pro poor dimension in the Action Plan.

F.6.2 Project 2: Rightsizing of production entities: the implementation of a Voluntary Retirement Scheme[12]

F.6.2.1 The social packages in the industry

109. In 1997, Government came up with a document on the closure of sugar factories entitled Blue Print on Centralisation of sugar Milling Operations in Mauritius. One of the main features of this document was the recommendation that employees affected by a factory closure would be offered compensation in cash and in kind if they accepted to voluntarily terminate their contract of employment. The Blue Print indicated that an employee would be entitled to cash compensation equivalent to 2.5 months per year of service and in kind compensation in the form of a plot of land of an extent ranging from 540 to 720 square metres with all infrastructural works having been effected . Moreover, the employee is also entitled to some other benefits and the children of the employees are entitled to scholarships in specified areas of study.

110. In 2001, the principle of compensation being paid to employees voluntarily terminating their contract of employment was extended to the growing activities of the sugar industry. Thus a scheme termed the Voluntary Retirement Scheme (VRS) was

[12] Details on this project are to be found in Project 2 of Annex 1

introduced. For purposes of the VRS two categories of workers were defined, those having more than a certain age and the rest. This categorisation was effected to work out a package to encourage and facilitate the departure of the elderly. Thus in any case when an offer of VRS is made to the employees of a producer, the offer had to be compulsorily made to those having more than a certain age. For the other employees, the employer has the liberty to choose to whom he makes an offer of a VRS but the decision to accept or reject the offer rest solely with the employee. Moreover, the older category was entitled to higher cash compensation, 2 months compensation per year of service plus the possibility to draw an early pension, as compared to 1.25 months on average for the others.

111. Initially, it was estimated in 2001 that some 5500 employees would avail themselves of the offers of a VRS. In fact 8000 employees accepted the VRS. The implementation of the Blue Print has enabled the closure of six factories so far and will allow the closure of a further seven in the coming years.

112. .The provisions of the Blue Print and the VRS have through attractive and socially acceptable packages facilitated the modernisation of the sugar industry and represent today a significant asset for the implementation of the Action Plan. Indeed, depending on the category and age of a VRS employee, he/she secures 4 to 6 times more compensation/value (value of land) than an employee in any other sector who is paid the severance allowance. For Blue Print employees the ratio moves to 6 to 8 times. These packages are in fact effective means to combat poverty among those having voluntarily terminated their contract of employment.

113. In 1997 and in 2001, Government came up with measures to relieve the producers of the high costs incurred in the implementation of the social packages of the Blue Print and the VRS. In both instances, the producers were offered the possibility to convert agricultural land and sell it, with minimal payment of land taxes, to recoup costs incurred. It is to be noted that the producers raise loans from banks to meet these social costs.

114. In 2001, the Bank of Mauritius (BoM) provided concessionary finance by way of a line of credit to provide relief to those implementing the VRS to the tune of Rs 2.4bn. This amount has to be compared to the total cost of the VRS i.e. Rs 3.4 bn.

115. The grant of concessionary finance and the determination of the land that has to be converted to recoup costs are monitored by the Mauritius Sugar Authority.

116. The sale of land by the sugar producers has been quite difficult in many cases essentially because of the low demand for land. This has resulted in a situation where many sugar companies in the milling and growing sectors are now heavily indebted. This indebtedness unless addressed will act as a major impediment to the implementation of the social plans of the Action Plan.

F.6.2.2 A new VRS: VRS 2

117. In the first VRS, some two thirds of those who left were the elderly employees who in fact received a very attractive package with benefits much higher than those they would have obtained if they had retired normally. The intent now is to encourage the younger employees to accept the VRS offer. In this context, some modifications have been made to what can be termed **VRS 1** to come up with what will be termed **VRS 2**. The age limit to benefit from a 2 months per year of service compensation is being brought from 50 years for women and 55 years for men to 45 and 50 years respectively. The package for the younger employees has been increased from an average of 1.25 months per year of service to 1.5 months. Moreover, there would be the implementation of reskilling programmes prior to the voluntary retirement of an employee. Tables 4 and 5 illustrate the packages of VRS 1 and 2.

Table 4: VRS package of 2001 (VRS 1) and proposal for 2006 (VRS 2)

Category of employees	Age (Years or more)		Cash compensation (months/year of service)	
	VRS 1	**VRS 2**	**VRS 1**	**VRS 2**
(a) Female agricultural worker	50	45	2.0	2.0
(b) Male agricultural or non-agricultural worker	55	50	2.0	2.0
All other cases including staff				
First 5 years of service			1.50	1.5
Next 10 years of service			1.25	1.5
Next 10 years of service			1.00	1.5
Remainder of service			0.75	1.5

118. Under the new scheme, it is expected that some 6000 employees will accept the VRS spread equally in the intercrop seasons of 2007 and 2008. The cost of the new VRS would amount to more than **Rs 3.6 billion** and has an internal rate of return of 5 %. Cash compensation is paid in year one while infrastructure costs and other social costs are incurred in years 2 and 3.

119. The funding of this project would have to comprise a mix of accompanying measures and producers' own fund.

120. The implementation of this project will facilitate the right-sizing of the labour force in order to reduce labour costs (especially in the estate sector) and create a more flexible labour force that will enable estates to accelerate mechanisation of field operations. Currently labour costs are very high by international standards and have a major bearing on the industry's costs of production.

F.6.3 Project 3: Difficult Areas[13]

121. The objective of the project is to prevent the adverse[14] environmental and social consequences of the potential loss of cane in difficult areas. Accordingly, Government views this project **from the pro-poor and the environmental perspectives**. Soil erosion from less stable land-use may cause sedimentation/eutrophication in downstream reservoirs or lagoons, which may have a negative impact on water supplies and also on aquatic biodiversity in downstream rivers, reservoirs and lagoons. The impact could be particularly significant on the coral reef, where sedimentation would have a particularly severe impact. The future of some 2500 fishermen engaged in coastal fishing could also be seriously affected. The maintenance of sugarcane cultivation will help to prevent soil erosion in the steeply sloped difficult areas (e.g. in the south of the island). In contrast, alternative uses could lead to unregulated development, overgrazing or less stable vegetable crops.

122. Difficult areas have the following characteristics:

(i) either the degree of rockiness is fairly high and intensive where even moderate derocking is uneconomical or the slope of the land under cane is steep;

(ii) mechanization even partial is difficult;

(iii) yields are fairly low;

(iv) cane cultivation costs are high;

(v) the very rocky areas are found in the drier parts of the country;

(vi) they are most exposed to the adverse impact of drought and cyclones;

(vii) they are cultivated mostly by small planters and by metayers, who lease the land from larger estates;

(viii) conversion into residential units and commercial sale is very difficult.

123. The issue of difficult areas has also to be considered taking into account that:

(i) the extent of land under forests in Mauritius is considered by the Ministry of Agro Industry to be on the low side;

[13] Details on this project are at Project 3 of Annex 1
[14] Photographs of difficult areas and the impact of the removal of cane are given in Annex 2

(ii) in certain areas, especially in the South West, eco-tourism projects or Integrated Resort Schemes (IRS) could be of interest.

124. Reforestation is better done by specialised and committed institutions. Eco-tourism or IRS projects can be environment friendly and facilitate job creation.

125. Some 5000 ha are found in what are termed difficult areas and they produce some 23.000t of sugar. The difficult situation ahead is bound to lead to loss of cane land in these areas, this has already been taken care of in the computation of the acreage under cane in 2015.After the movement of land away from cane in these areas, there would still be some 2000ha under cane with a production potential of at least 12 000t of sugar i.e. equivalent to the US quota.

126. The policy measures will therefore address two categories of land: land remaining under cane and land which would no longer be under cane.

127. Regarding the first category, the following is relevant:

(i) the regrouping exercise would be carried out and better cultural practices and varieties would be introduced and these planters would benefit from the same incentives as under the regrouping scheme;

(ii) provision of financial support, as is made available in the EU in respect of mountainous and difficult regions for social and environmental considerations, metayers and small planters, vulnerable partners of the industry would benefit from such measures.

128. For the second category, the following approach is being adopted:

(i) the cultivation of crops including fruit trees that have a positive effect on land conservation;

(ii) the cultivation of high fibre cane or energy crops once identified and found to be commercially viable and sustainable;

(iii) reforestation;

(iv) The development of eco-tourism and IRS projects.

129. Moreover, the possibility of establishing wind farms combined with cane in part of those areas moving away from cane is being explored. The Bel Ombre, St Félix, St Antoine, Gris Gris and Grand Bassin regions have been found to be attractive sites in this regard. The first two regions are considered as difficult areas.

130. In these circumstances, the following is relevant:

(i) support to these regions which would remain under sugar cane by way of a grant of Rs20 000/ha for 2000 hectares will start in 2008 (year when prices drop by 17%) and go till 2015 i.e. 8 years; there would thus be need of direct support of Rs40M yearly over the 2008-2015 period representing an overall amount of Rs320M.

(ii) the support would cover a lesser extent of land, some 2,000 hectares as opposed to 5,000 hectares;

(iii) the cultivation of crops other than sugar cane destined for sugar production to be undertaken under the aegis of the Ministry of Agro-industry and the MSIRI;

(iv) a reforestation programme undertaken by specialised institutions;

(v) an incentive package destined to foster eco-tourism and IRS projects.

131. The total project cost of Rs400 M would provide some funds for the non-cane projects. However, the bulk of the funds for these projects would have to be secured from other sources.

F.6.4 Project 4: Centralisation of sugar factories[15]

132. This project can be summarised as follows:

(i) The objective of this project is to improve the cost competitiveness of the Mauritian sugar milling sector by:
   (a) Reducing the number of mills from eleven to four.
   (b) Increasing the milling capacity of two important mills FUEL and Savannah to accommodate additional cane supplies.

(ii) Mill centralisation is one of the key measures required to lower the costs of producing sugar in Mauritius, and thereby ensuring that the industry is sustainable following the substantial price reduction in the EU;

(iii) The closure of the mills will lead to the redundancy of around 1,200 workers employed in the milling sector. These workers will receive comprehensive and attractive compensation packages, the costs of which (around Rs1.3 billion) are included in the project.

(iv) The financial costs of the project are estimated at Rs2.9 billion. The high cost of the project reflects in part the high social costs that are associated with the project. The project offers an internal rate of return of 29 %.

[15] Details on this project are at Project 4 of Annex 1

(v) The project is expected to have a significant positive impact on water quality, since older more polluting factories are being closed, and clean technologies are either in place or being introduced to the remaining ones. This will also have positive impact on surface water abstractions downstream of factories earmarked for closure.

(vi) There is often a time lag between factory closure and ex-workers obtaining their land title deeds. Funds set aside for construction works are often drawn upon during this period. The time also applies to the VRS employees.

133. Currently there are 11 sugar factories; in a few years time the number will decrease to 4. The closures would be affected in the context of a global plan whose primary objectives are to have very efficient and well supplied mills while optimising existing or planned increase in capacity and minimising transport costs. As a result of this approach there would be a mill in each of the four regions i.e. the North, the Centre East, the West and the South. Table 5 shows the key parameters of these factories which would in fact function as sub clusters.

Table 5: Key parameters of the four sub clusters

Receiving Factory	Projected Cane and sugar production	Cane Crushing capacity Tonne Cane per Hour (TCH)	Power plant installed and to be installed capacity MW	Industrial Ethanol production capacity M litres	Special and white sugar production lines
Savannah (South)	1.7Mt canes and 185 000 t sugar	425	126	30	Yes
FUEL (Centre/ East)	1.55 Mt canes and 170 000 t sugar	450	106	30	Yes
Medine (West)	0.5 Mt canes and 55 000 t sugar	200	35	Molasses already being used for other purposes	-
Belle Vue (North)	1.0 Mt canes and 110 000 t sugar	350	73	Molasses used being used for other purposes.	Yes

Source: MSA

134. Table 5 shows the components of the cluster that would come into being upon the implementation of the Action Plan. There would be limited investments at Belle Vue which had in the late nineties significantly upgraded its crushing capacity to receive the

canes of two factories which closed down namely: Mount and Beau Plan. It commissioned 2 x 35.5 MW bagasse/coal firm power plants operating at 82 bars. The molasses of Belle Vue is used at the Beau Plan distillery to produce potable alcohol. The only investment at Belle Vue would be to increase its crushing capacity from 325 TCH to 350 TCH. With its special/white sugar production and the 2x35MW power plants associated to it, Belle Vue is already operating in a cluster mode. The commissioning of a 35MW bagasse/coal firm power plant operating at 82 bars is the only investment to be effected at Medine. This investment is linked to Médine securing some 100 000 tonnes of cane which itself depends on the construction o a road linking the centre of the island to the west. On this basis, it is considered that Medine would be exporting on the grid as from 2012. The molasses of this factory is used in the Medine distillery to produce potable alcohol. The major developments would take place at Savannah and FUEL.

135. **Constraints to the Cluster**: they relate mainly to the provisions of the Cane Planters and Millers Arbitration and Control Board Act (CPMACB) which preclude three major developments envisaged in the context of the cluster, namely the packing or conditioning of sugar at the mill for export purposes, the dual production of sugar and ethanol from cane juice and the use of cane juice to produce Rhum Agricole. Currently sugar weight is determined when it reaches the storage areas in Port Louis, Bulk Terminal or the warehouse of the Bagged Sugar Storage and Distribution Company (BSSDC), while cane juice can only be used for sugar manufacture. It is to be recalled that at present production of Rhum Agricole has to be effected outside sugar factories.

136. The rationale for the constraints imposed by the CPMACB go deep into history, they came into being as planters considered that the sugar in their canes would not be properly assessed by the millers.

137. **How to best address these constraints?** Two steps are critical before proceeding to the adaptation of the provision of the CPMACB. Firstly, the participation of planters, in the equity of the mills on terms to be worked out and agreed jointly between Government and the corporate sector, and secondly, the **conclusion of cane management arrangements** between planters and the millers. **The reinforced commonality which would establish an organic link between two key stakeholders of the industry will ensure enhanced revenue and security for all stakeholders** and also pave the way for a situation where the mill will in fact buy cane biomass i.e. the cane stalks with sugar and the leaves and trash which represent combustible for the boilers.

F.6.5 Emerging sectors in the sugar cane cluster[16]

138. So far 50% of the potential of bagasse is tapped to generate electricity for export to the grid. No use is made in energy terms of the molasses resulting from sugar manufacture. Technological development and the introduction of canes with higher sucrose and fibre content can significantly enhance the energy potential of the cane plant. The inevitable rise in oil prices will create further opportunities to use cane biomass.

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[16] Details on electricity and ethanol projects are to be found in Projects 5 and 6 of Annex 1.

139. The energy issue has to be viewed in the following context:

(i) the economy of Mauritius is expected to grow at 5% or more in the coming years;

(ii) new poles of economic growth will be energy and electricity intensive;

(v) Mauritius is not endowed with fossil fuel resources;

(vi) water resources are limited and at best, in exceptionally heavy rainfall years, only 140 GWh of electricity can be generated from hydroelectric stations compared to current total generation of 2000 GWh.

140. But, Mauritius has a crop, sugar cane, which is the most efficient converter of solar energy of all cultivated crops. The fairly high yield of canes per unit area further enhances the energy potential of this plant.

141. Last but not least, sugar cane has the potential to become a bio-factory. Accordingly, this part of the Action Plan is fairly extensive. The role of cane as an energy plant and as a biofactory is outlined; the economics of the products of sugar cane: bagasse, molasses and cane juice against oil products: heavy fuel oil and gasoline is compared; the particulars of investments in electricity and ethanol production are given; the future contribution of technological development and research is indicated.

F.6.5.1 Cane as an energy plant and as a bio factory

142. The development of the sugar cluster is critical for the sugar cane industry. In this respect, it is essential to understand the full potential of the cane plant and to assess the economics of the use of its by products compared to oil and oil derived products. Table 6 compares the cane plant and oil for a variety of end uses. On reading this table it is clear that in many respects **cane is, and can be, a very effective substitute for oil for a vast array of use and products**.

Table 6: Comparison between cane and oil

Item	Cane a local, renewable and environment friendly resource	Oil an imported and exhaustible fossil fuel
Electricity	Bagasse: higher electricity yields can be obtained if higher fibre cane or more efficient technologies are used	several products: diesel, kerosene, heavy fuel oil
Vehicles	ethanol	gasoline, diesel
Chemical industry	organic plastics	Petrochemicals are an essential element of the

		industrial set up.
Textile industry	Fibres	Fibres
Operation as a biofactory (in the long term)	Possible if research moves to commercial stage, protein, pharmaceuticals, neutraceuticals, vaccines, polymers can be obtained.	Not applicable

Sources: MSA and MSIRI

143. Gasification of bagasse currently at the Research and Development stage and the use of fuel canes, with fibre contents of more than 40 % will considerably increase electricity output from biomass.

F.6.5.2 By products versus oil products, and economic analysis

A. Ethanol

144. Until now, the production of ethanol was constrained by problems associated with the disposal of vinasse. This issue has been resolved and vinasse and the treated vinasse also called concentrated molasses stillage (CMS) will be used as a fertiliser after the addition of urea and phosphoric acid. Any plant needs three fundamental elements, Potassium, Nitrogen and Phosphorus. They will be brought in the case of this fertiliser by vinasse (Potassium), urea (Nitrogen) and phosphoric acid (Phosphorus). It is considered that this fertiliser can bring down the overall cost of fertilisation which is an important component of the cost of production. The investments estimated for the ethanol plants incorporate vinasse treatment facilities.

145. In a country like Mauritius the grant of subsidies from Government is impossible, the more so in a situation of significant budget deficit. Then the assessment of financial viability of an ethanol project has to be effected by comparing locally produced ethanol with the import price of a product having the same use, in this case gasoline (also called mogas in Mauritius).

146. The comparison is carried out between ethanol produced in a distillery and delivered to the harbour region where blending with gasoline can be made and the cif price of gasoline.

147. Ethanol obtained from two substrates, molasses and cane juice, is compared to gasoline. Three situations are analysed: ethanol obtained from molasses; ethanol obtained from molasses and cane juice, both substrates having an equal contribution in the volume of production; and ethanol obtained from cane juice only. The ex-factory molasses price is taken as Rs1500/tonne while the price of cane juice as raw material for ethanol production is derived from the price of raw sugar after the 36% reduction in

price[17]. Similar to the price of oil, the price of molasses fluctuates. Over the past years, it has moved from Rs125 to Rs1500/tonne i.e. the cost of molasses as a raw material for ethanol production ranges from Rs0.50 to Rs6.00 per litre of ethanol[18] and the average is assumed as Rs 3.00/litre.

148. The production cost, inclusive of financial costs and return on capital, of one litre of ethanol from cane biomass substrates is around Rs 6.00 /litre. The transport cost to the blending station is around Rs 2.00. The gasoline price for a crude price of 60$/ barrel is Rs 17.60 per litre.

149. Table 7 shows the comparison between gasoline and ethanol from various sources and the cut off points at which ethanol is financially more attractive are expressed in terms of crude prices per barrel.

Table 7: Comparison of gasoline with ethanol in terms of crude prices $/barrel

Substrate	**Molasses price Rs 125/t**	**Molasses price Rs 750/t**	**Molasses price Rs 1500/t**
Molasses	29	38	48
Cane juice[19]	83	83	83
50% Molasses and 50 % Cane juice	56	60	65

Information from various sources and table worked out by the MSA

150. The foreign exchange savings amount to the price of gasoline less the price of molasses, which if not used to produce ethanol would have been exported, and 40% of the operational and transport costs.

151. The above paragraphs on costs and table 6 call for the following comments:

(i) at current oil prices(60 $/barrel), the production of 30 M litres ethanol from 120 000 tonnes molasses[20] to displace gasoline would increase producer revenue by at least **Rs 108M**[21];

[17] Price of sugar today: Rs 17500 per tonne inclusive of molasses equivalent. Price of one tonne cane after 36 % reduction 17500 x.64x.11 (extraction rate) =Rs 1230. 1 tonne cane yields 75 litres ethanol, price of cane juice as raw material =Rs 16.40/litre.

[18] 1 tonne of molasses yields 250 litres of ethanol.

[19] Cane juice prices are insensitive to molasses price fluctuations as they are derived from cane prices themselves dependent on sugar prices.

[20] Re part D.1.3 on production statistics which indicates the amount of molasses available to produce ethanol.

(ii) the break even point between gasoline and ethanol from cane juice, in a 36% price reduction, is an oil price of 83 $/barrel; reduction of capital costs and tax incentives can reduce this cut off point;

(iii) as from 83$ a barrel, revenue from cane juice derived ethanol starts mitigating the impact of the 36% reduction but the extent depends on the pricing policy for gasoline, would it be producer geared of consumer geared, in other words who would benefit from the advantages of using cane juice;

(iv) At prices in excess of 83 $/barrel, the arbitrage has to be done by the factory by comparing raw sugar prices with the price of specials/whites and by also comparing dollar/euro exchange rates; this is precisely what is done , albeit in a different context, by the Brazilian flexi factories which optimise value added;

(v) 120 000 tonnes of molasses are sufficient for the production of ethanol for a 20/80 ethanol/gasoline blend[22], higher ethanol quantities would either require higher blends or exports if overseas markets are attractive;

(vi) Flexibility to produce ethanol or different types of sugars can only be achieved if the distillery is linked to the factory, which will meet energy requirements to the distillery at almost no cost, moreover, this avoids the cost of transporting molasses. The Brazilian approach which is very successful is based on the sugar cluster/flexifactory approach.

B. Electricity

152. Electricity can either be obtained from installations using bagasse/coal or installations using heavy fuel oil. The two types of installations can provide similar quantities of power and energy .The Savannah type of plants 42 MW operating at 82 bars can deliver to the grid :625 kWh/ tonne of bagasse working in a condensation mode and 1850 kWh/tonne from coal. The heavy fuel oil plants can deliver 4800 kWh, tonne. Investment and operational costs[23] per unit of electricity are higher for the bagasse/coal plant.

153. The factory-linked power plants supply energy in the form of electricity, low pressure steam and hot water to sugar factories which use the energy for sugar manufacture in any form: raw, special, refined or industrial. In exchange, the factory supplies bagasse free of charge to the power plant.

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[21] Rs 17.60 minus Rs 14.00: made up of cost of molasses Rs 6.00, manufacturing costs Rs 6.00 and transport costs Rs 2.00 i.e a margin of Rs 3.60 is obtained per litre.
[22] Gasoline use is expected to go to 150 M litres.
[23] Theree is a difference of 0.13 cent per kWh.

154. Sugar and power are produced by different companies. However, the majority in the equity of power plants is held by either the sugar milling company or the holding company of the sugar milling company. The Sugar Investment Trust is a shareholder of both.

155. The foreign exchange involved in the generation and export to the grid of electricity from the two types of installations has been compared and savings for 625 GWh (production of the three 42 MW plants) obtained at Savannah computed. On the basis of the configuration of the cluster at Savannah,[24] 32% of the exported electricity units would come from bagasse and 68 % from coal.

156. At a crude price of 60$ a barrel, the price of heavy fuel oil (HFO) is 280$/tonne.Currently the price of coal is 55 $/ tonne. All prices being c.i.f Mauritius. In the comparative exercise, the price of HFO is derived for crude prices of 60, 80 and 100 $/barrel. The price of coal is worked out assuming that the price of oil moves two and a half times faster. Table 8 shows the results of the comparison exercise.

Table 8: Comparison of economic (or border) costs, expressed in Rs per kWh, of Heavy Fuel Oil (HFO) plants and coal/bagasse ones

	60 $/barrel	**80 $/barrel**	**100 $/barrel**
HFO	2.18	2.77	3.38
Coal/bagasse	1.07	1.14	1.23
Savings if coal /bagasse used /kWh	1.11	1.63	2.15
Yearly savings over 625 GWh exported by 3 units at Savannah if coal /bagasse used, Rs M	694	1019	1344

Information from various sources and table worked out by the MSA

157. The comparison between bagasse/coal and HFO can be effected in a different way i.e under what conditions does the first option become more interesting than the second one. Whenever the price of HFO exceeds that of coal by 1.9 times, say twice, it is more interesting to produce electricity from bagasse/coal. Experience shows that the two to one ratio has always been exceeded.

158. The economic imperative of producing electricity from bagasse/coal as opposed to heavy fuel oil is once more demonstrated and it is in the interest of the country to optimise the use of the by products of sugar cane processing.

F.6.5.3 Electricity and ethanol production

159. The first firm power plant was commissioned by FUEL in 1984 and it operated at 44 bars. At this pressure, yield, at condensation, is **475** kWh/tonne of bagasse and **1400**

[24] Details on the cluster are at Annex 2.

kWh/tonne of coal. The power plant at Belle Vue innovated in that it was for the first time that an operating pressure of 82 bars was being used. The plant at Belle Vue allowed significant gains in electricity yield **560** kWh for bagasse and **1675** kWh for coal. The existence of twin sets was more interesting in terms of security of supply while the amount and quality of power dispatched to the grid proved to be very useful to the CEB for its network stability.

160. The Belle Vue model has been emulated in Savannah which has already signed a Power Purchase Agreement for the commissioning of 2 x 42 MW/82 bar bagasse/coal firm power plants in 2007. Savannah was planning for two units in a context when St Aubin sugar factory was going to remain in operation. Now with the projected closure of St Aubin, Savannah expects to commission a further 42 MW plan in 2008. The plants at Savannah can yield, at condensation, 625 kWh/t bagasse and 1850 kWh/t of coal. Medine has also the intent to commission a similar plant in 2012

161. The milling of some 1.55 million tonnes at FUEL warrants the erection of 2 x 42 MW/82 bar plants. The first plant should imperatively be operational between 2008 and 2009 to enable the completion of the centralisation process in the East, at latest after the 2008 crop. Such plants would yield higher amounts of electricity from bagasse and thus an additional amount of 45 to 59 GWh would be obtained from this combustible. More efficient burning of coal would decrease the foreign exchange spent per coal derived KWh from Rs1.43 to Rs1.08. FUEL is finalising a proposal for 2 x 42MW/82 bar plants for submission to the Ministry of Public Utilities' Technical Committee. The new plants at FUEL are expected to come on line in a phased manner as from 2009.

162. The new plants at Savannah, Medine and FUEL (82 bar) would export some 1250 GWh. One kWh from such plants, as shown in table 3, is cheaper by Rs 1.11 in terms of foreign exchange when compared to a KWh obtained from heavy fuel oil. Thus 1250 GWh allow the savings of **Rs 1.390 billions of foreign exchange yearly** on an oil price of 60$/barrel and **Rs2.690** billions on the basis of an oil price of 100$/barrel.

163. Savannah and FUEL would on the basis of the amount of canes they would mill produce some 50 000 to 55 000 tonnes of molasses each. From this amount of molasses, some 12.5 million litres of ethanol can be obtained. More ethanol can be obtained if molasses is brought from other factories. Thus distilleries at Savannah and FUEL would enable the production of some 30M litres of ethanol i.e. 24% of the 125M litres of gasoline used yearly or 20 % of the projected consumption of 150 M litres.

164. The cogeneration project can be summarised as follows:

(i) The objective of the project is to increase the contribution of the sugarcane cluster to national electricity production. This will be achieved by increasing the productive capacity of the sugar industry's in terms of firm power plants.

(ii) The financial costs of the project are estimated at Rs10.3billion. Overall, the project offers an internal rate of return of around 23%.

(iii) The major economic benefits of this project are:

(a) An increase in the contribution of bagasse to national energy requirements.

(b) A reduction in the future requirement for imported fuels. In this way, increasing cogeneration helps to off-set, to some extent, the negative impact on foreign exchange that will result from the erosion of preferences to the EU market.

(iv) From an environmental perspective, there is a potentially significant impact on water quality resulting from increased effluents, sludges and/or solid wastes contaminated by heavy metals and other toxic contaminants entrained in the coal and process waters. Adequate treatment/disposal will be required for all coal-contaminated wastes.

(v) The development of modern co-generation plants will reduce the need to expand existing fuel oil plants and should have a significant positive impact on air pollution on the island. The feasibility of circulating fluidised bed combustion and gasification processes should also be investigated to further improve emissions.

(vi) There are net positive global benefits from coal/bagasse co-generation plants if sufficient carbon-neutral bagasse is burnt to offset higher CO_2 emissions of coal relative to fuel oil. Therefore, there is a possibility that specific projects could be used to generate Emissions Reduction Credits (CERs) under the Kyoto protocol. The value of these CER's could be as much as US$20 per tonne of coal offset by bagasse. However, detailed case-by-case investigations of potential for generating CERs are needed using approved methodologies under the Clean Development Mechanism.

165. The ethanol project can be summarised as follows:

(i) The production of molasses-based ethanol for sale to the EU is financially attractive, as long as prices in the EU market do not fall to Brazil's supply price.

(ii) At a world oil price of US$30-40 per barrel, molasses ethanol would be competitive with gasoline on the domestic market and the government would not need to offer financial incentives, such as tax breaks, to encourage its use.

(iii) Unless oil prices reach around US$ 80-90 per barrel, the production of ethanol from cane juice would generate negative returns owing to the high opportunity cost of cane juice. This reflects the fact that the marginal tonne of cane is valued at preferential sugar prices, i.e., the EU domestic sugar price or the price of speciality sugars.

(iv) The additional foreign exchange generated by producing ethanol from molasses would far outweigh the foreign exchange lost from molasses exports.

(v) Investment costs for the production of hydrous alcohol are Rs 220 M per plant and Rs 320 M per plant for anhydrous alcohol;

(vi) For producing hydrous ethanol for export to the EU, the project offers an IRR of 53%, assuming that EU prices remain around recent levels. For anhydrous ethanol for blending in gasoline, the project offers an IRR of around 30%, assuming that world oil price is US$40 per barrel. However, in contrast, the return is only 2% if the world price of oil is US$30 per barrel. This assumes the government provides no fiscal incentives to promote the use of fuel ethanol.

166. The choice of investment for ethanol depends to a large extent on the blending policy. Indeed, blending imperatively requires anhydrous alcohol while both types of alcohol can be exported. For purposes of working out investment figures , the anhydrous option has been chosen.

F.6.6 Cess Reduction[25]

167. The industry is serviced by a certain number of institutions which are funded through various means as indicated in table 9.

Table 9: The institutions servicing the sugar industry

Institution	Function	Funding
Mauritius Sugar Authority (MSA)	Overall policy formulation and monitoring to ensure that sugar industry remains viable.	Cess
Mauritius Sugar Industry Research Institute (MSIRI)	Research, development and extension activities	Cess
Cane Planters and Millers Arbitration and	Cane testing and weighing control and arbitrating disputes	Cess

[25] Details on this project are to be found in Project 7 of Annex 2.

Control Board (CPMACB)	relations between planters and millers.	
Sugar Planters Mechanical Pool Corporation (SPMPC)	Provision of land preparation equipment to small planters.	Cess 63% and payment for work undertaken 37%.
Farmers Service Corporation (FSC)	Extension Service	80% cess, 20% Government
Mauritius Sugar Terminal Corporation (MSTC)	Storage, handling of bulk sugar for export.	Cess
Sugar Industry Labour Welfare Fund (SILWF)	Social welfare/recreational facilities at village levels.	20% cess and 80% from sale proceeds.
Mauritius Sugar Syndicate (MSS)	Marketing of Sugar	Funds taken from sale proceeds.
Sugar Insurance Fund (SIFB)	Crop insurance	Premium raised on net sugar proceeds.
Bagged Sugar Storage and Distribution Company (BSSDC)	Storage, handling of bagged sugar for export and the domestic market.	Financed by Mauritius Sugar Syndicate from sale proceeds.
Irrigation Authority	Implementation and monitoring of irrigation projects in respect of small planters.	Government for recurrent expenditure and bilateral loans through Government for capital expenditure.

Source: MSA

168. The budget estimates of these institutions funded by the Cess is scrutinized by the Mauritius Sugar Authority (MSA) and submitted for approval to the Minister of Agro-Industry. Once the estimates are approved, the MSA raises funds from the sale proceeds of sugar.

169. Cost reduction programmes involving similar magnitude of reduction would be implemented for all these institutions. Such programmes would be put in place by all institutions funded by the Cess. Equally the Sugar Insurance Fund, on the basis of its latest Actuarial Report and by the MSS and the BSSDC through a rationalization of operations and the reduction of financial charges would bring down their costs of operation. The Irrigation Authority will also follow the same approach.

170. The following indications will to facilitate the understanding of the use of the Cess annually:

(i) Some Rs85M are paid by way of pensions to workers made redundant in the late seventies in the context of the construction of bulk handling facilities for sugar;

(ii) some Rs27M are paid to the Sugar Industry Labour Welfare Fund which services the whole rural community and not only sugar employees;

(iii) the MSTC is still paying Rs18M as dividend yearly to Government for funding facilities provided in 1974 for the construction of the sugar bulk terminal; the organisation is owned by Government 58% and producers 42%;

(iv) the rates charged on service provided by land preparation equipment owned by the SPMPC have not increased since 1988; in fact, the funding of the SPMPC by some Rs105M out of cess is a subsidy given to planters for land preparation;

(v) research costs (MSIRI) amount to Rs165M or 1.6% of sugar proceeds to producers;

(vi) cane testing and control (CPMACB) cost Rs65M, while the MSA accounts for Rs35M;

(vii) some Rs70M go to the FSC, Rs42M thereof are subsidies in respect of cane setts, fertilizers and the payment of lower rates for use of electricity for irrigation by planters;

(viii) Rs340M represent employees costs.

171. The amount financed under cess for the various institutions is aggregated into what is termed the Global Cess. It currently stands at Rs625M i.e. Rs1140/tonne of sugar (based on a production of 550 000t).The objective is to substantially reduce the Global Cess . Reductions of Rs 200M or Rs 300M would represent additional revenue of Rs1600 M and 2400M respectively over the 2008-2015 eight year period.

172. This objective could be met by taking the following measures:

(i) transferring of certain elements of expenditure to Government i.e. pension to redundant workers(85 M), contribution to SILWF(27M) and non payment of dividend (18M) to Government; this would save Rs130M;

(ii) administrative cost reduction and rightsizing of human resources whereby Rs120M could be saved;

(iii) savings can be made on subsidy given in respect of tractor rates as the cost of most of the derocking/land preparation would be met through the sale of rocks to stonecrushers, savings of some Rs50-60M can be made;

(iv) the conclusion of cane cultivation agreements and equity participation of cane growers in sugar milling/energy projects can significantly reduce the cost of cane testing.

173. The cost of rightsizing the cess funded institutions i.e. cash compensation and pension benefits and pension liabilities is estimated at Rs900M.These reductions would apply to the MSIRI, the FSC, the SPMPC, the MSTC, the CPMACB and the MSA. The SILWF is not being considered.

174. The transfer of costs to Government will be subject to the policy of Government to reduce the budget deficit. Government may accept part on the totality of the transfer or not accept any transfer.

175. In case of part or non-transfer, there are two options:

(i) the ambition on reduction of cess is lowered; or

(ii) other means are devised to increase the revenue of the producers.

176. The way forward is firstly, for Government as from 2008 to forego the Rs 18 M of dividend it receives and for the Rs 27 M paid as cess money to the SILWF to be equally shared between Government and cess. This would reduce cess by Rs 30 M as from 2008. Secondly, producers can receive additional revenue through the increase of the price of sugar on the local market as will be explained in Section H.2.

F.6.7 Research [26] and technological development

177. When the industry is transforming itself from one of a single commodity i.e. sugar to a complex agri-business with significant emphasis on renewable biomass, Research and Development (R&D) is expected to assume an even greater role than in the past. While R&D is the gateway to enable the industry to stay competitive and sustainable, it will also enable it to comply with the strict environmental norms that are warranted in a small island and that will equally henceforth prevail around the world.

178. R&D will concentrate on areas of crop improvement, biotechnology, co-products and biomass utilization/valorization in which there is scope for quantum gains. It will consolidate its activities in other areas such as agronomy, crop protection and technology transfer to ensure that the acquired gains are consolidated and fully exploited.

[26] Details on this project are to be found in Project 9 of Annex 1.

179. The research strategy is two-fold. Short-term measures such as the rapid replacement of old established varieties which are out-yielded by newly released ones would be implemented and this is a matter which rests solely with extension and technology transfer to the producers. The medium to long term strategy comprises the use of novel technologies and the introduction of high quality, energy and fuel canes.

180. The efforts in novel technologies including biotechnology will be enhanced with the objective of producing improved and more productive varieties. Furthermore, studies will be initiated to access the more long term perspective, namely the tapping of the potential of the sugar cane plant as a biofactory for the production of high value-added molecules e.g. protein, textile, products, pharmaceuticals, neutraceuticals, vaccines, polymers.

181. Regarding high sucrose canes, the following is relevant in respect of research being undertaken by the MSIRI:

(i) Short-term measures such as the rapid replacement of old established varieties which are out-yielded by newly released ones would be implemented and this is a matter which rests solely with extension and technology transfer to the producers;

(ii) The medium to long term strategy comprises the use of novel technologies and the introduction of high quality canes;

(iii) The efforts in novel technologies including biotechnology will be enhanced with the objective of producing improved and more productive varieties, while remaining within the permitted norms of our sugar buyers.

182. Investigations and industrial scale trials on the use of cane field residues as a complementary fuel to bagasse for energy generation has been conducted by the MSA and commercial exploitation of the successful experience will be undertaken to enhance energy export from cane biomass to the grid in the power plants in operation. Cane biomass fractions can also be separated through the use of dry cane cleaning plants whereby cane stalk (whole or in mechanically chopped billets) will be separated from trash and leaves, the first fraction going to the mills for sugar recovery and the latter, after minimal shredding, mixed with bagasse leaving the mill and sent to the boiler as additional fuel. It has to be highlighted that cane field residues are readily available and are normally left in the field after cane harvest.

183. Additional energy can be obtained through adoption and commercialisation of energy and fuel canes. In this context the following is relevant:

(i) Energy/Fuel canes could provide cost-effective alternatives in the use of cane as a source of renewable biomass for the production of electricity. The fuel cane with its very high fibre content is suitable only for energy production. Its stalk, tops, leaves and trash can be used for this purpose.

The energy cane, which has a sufficiently high sucrose content can be used both for sugar and energy production. The fibre output per hectare of fuel cane could be up to three to four times that of typical sugar cane varieties;

(ii) Their costs of production would be lower than those of cane meant for sugar production as Energy/Fuel canes have a much higher ratooning capacity, require less replanting, less weed control, and they show higher resistance to pests, diseases and wind;

(iii) Given their vigour, they could be particularly suitable for marginal lands. Fuel canes could be harvested over an extended period compared to the commercial sugar cane. This would allow the idle time of mechanical harvesters to be reduced. Their fibre output per hectare could be three to four times that of typical sugar cane;

(iv) The high quality, energy and fuel cane clones imported will be bulked through micropropagation and evaluated in the field to confirm their potential under local conditions, especially the sucrose content and/or fibre content. Current agronomic management practices will be revisited to optimise the cane and total biomass yields. The reaction to diseases and pests will also be assessed to ensure that the clones are resistant or have the required level of tolerance and that they do not represent any danger to the industry in the field of crop protection;

(v) The clones will also be used as parents in the breeding programme and appropriate crosses will be made either to incorporate genes which may be lacking or to increase further their potential e.g. through hybridisation with the 40 new varieties of *Saccharum spontaneum* that have recently been imported into Mauritius.

184. The efficiency of conversion of bagasse into electricity depends on three factors:

(i) a greater amount of steam going to full condensation, as a result of the adoption of energy conservation and efficiency measures in cane juice processing and this is possible in cases when factory installations are adjusted to adapt to efficient electricity generation systems as in Belle Vue, Savannah and FUEL;

(ii) Use of high pressures 82 bars and even 110 bars (if found feasible);

(iii) Use of different technology, gasification as opposed to the current steam production systems, however, this pathway, very promising, is still at the Research and Development stage.

185. To achieve the above, an amount of Rs 500 million has been earmarked for the 2006-2015 period and this includes R&D, establishment of pilot laboratory and industrial plants, field trials, acquisition and introduction of germplasm, technology costs.

G. Facilitation of agricultural diversification

186. Given that the numerous trials for large scale commercial cultivation of non-sugar crops have been largely unsuccessful, attention was, and will continue to be focused on the use of cane land namely cane interlines or rotational land. Cane interlines are available for the first three months of the growth of virgin or a first ratoon cane. Rotational land is available for some six months i.e. the time between the uprooting of a cane at the end of a crop cycle and the start of a new crop cycle.

187. In Mauritius, the concept of diversification within sugar includes the optimal use of by-products, the production of special sugars, as well as the optimal use of cane interlines and cane rotational land for the production of vegetables. Agricultural production is limited to vegetables as the production on a large scale of the major items of food is totally uneconomical or not feasible. Thus, rice and flour, maize, meat and meat products, oil, and oil cake, dairy products, non tropical fruits have to be imported. Mauritius is more or less self-sufficient in respect of tropical fruits. vegetables and poultry.

188. The Sugar Industry Efficiency Act 1988 came up with incentives to encourage the maximal use of cane land. Over time, the measures were refined and adapted and are now incorporated in the SIE Act 2001. These incentives have impacted positively on foodcrop production, a large part of which comes from cane land. Foodcrop production has increased from some 45.000 tonnes in 1988 to around 130.000t in recent years.

189. Cane land used for diversification comes essentially from those plantations of the corporate sector which are well prepared and have irrigation facilities in the drier regions. The major part of the cane land is rented out to small growers who generally cultivate a wide variety of foodcrops. The corporate sector is involved mainly in the cultivation of potatoes.

190. In the coming years, the non-sugar sector will be confronted with several challenges:

(i) produce a larger volume of quality foodcrops to satisfy the needs of a much higher inflow of tourists with Mauritius becoming a duty free country and meet the demand generated by a higher per capita consumption of fruits and vegetables of a population increasingly aspiring to a healthier life style;

(ii) produce a wider variety of foodcrops to cater for the growing demand for safer and higher quality food; and

(iii) reduce cost of production through increased productivity per unit area of land and per unit of investment.

191. These challenges will be met essentially through the implementation of the Non-Sugar Sector Strategic Plan.

192. As a further example of stakeholder involvement and multifunctionality the cane sector will on its part contribute in meeting those challenges through the provision of yet larger extents of land and a higher involvement of small planters.

193. Additional land will be released for diversification on account of the following:

(i) the implementation of the Action Plan through the improvement of land preparation and the provision of irrigation would make larger extents of land, interline and rotational land, suitable for foodcrop cultivation;

(ii) better land preparation can accomodate shorter cane crop cycles 5 years instead of 8 years and this results in higher extent of land being made available for foodcrops. An 8 year cycle means that foodcrop diversification on interline and rotational land can take place on 12.5% of the land yearly. A 5 year cane crop cycle increases this figure to 20%;

(iii) improved land preparation will allow for greater use of 1st ratoon interlines;

(iv) the regrouping of small planters coupled with better land preparation and better irrigation facilities will increase land availability for foodcrop cultivation and cultivation by small planters;

(v) Land released from sugar cane.

H. Other components of the Action Plan

H.1 Indebtedness

194. The industry's ability to implement these programmes is financially constrained. This according to LMC is for two main reasons:

(i) The high cost of compensation offered to field and factory workers to retire voluntarily from the industry under the Sugar Sector Strategic Plan 2001-2005. Estates and millers were to recover these costs through the sale of land facilitated by a government scheme to convert agricultural land to commercial use. However, the market for commercial land has been very subdued. These problems were compounded by the difficult situation that was faced by the industry during the period 1998 to 2001, when the industry often faced drought conditions and a weak euro. As a

result, the industry is now burdened with a high level of debt, which will prevent it from sourcing commercial finance to implement many elements of the Strategic Plan,

(ii) The much deeper than anticipated cut in sugar prices that is envisaged in the EU's reform proposals means that several of the accelerated reform initiatives will not generate a commercially acceptable return in the short term. This is despite the fact that they will enable the industry to face a sustainable future.

195. These commercial constraints pose a serious challenge to the country as a whole, because of the social, environmental and macro-economic contribution of the sugar sector to Mauritian society. Moreover, the provisions of the Companies Act are such that any company director would have to exercise the appropriate fiduciary responsibility before embarking on any major project. Equally, both small and large producers cannot responsibly operate in a situation of indebtedness. Accordingly, indebtedness would be a major impediment in the implementation of the accelerated Strategic Plan.

196. Overall indebtedness was initially at 135M€. 50% thereof i.e. 67M€ could be recouped without difficulty through the sale of land. The 67M€ left were included in the first LMC report. This figure has come down and would now be closer to 40M€. However, there are certain companies, in particular in the milling sector that still have a serious indebtedness problem. The possibility of securing funds from the accompanying measures seems to be very difficult given the low level of such measures and the nature and essentiality of other competing projects. Accordingly, the strategy that has been worked out comprises a mix of incentives and measures taken to enhance revenue and avoid or reduce future debt burdens. In this regard, the following is relevant:

(i) meeting a large part of the new VRS and factory closure social costs through accompanying measures; savings on lower labour costs or additional revenue through higher sugar accruing would procure resources to alleviate the past debt burden;

(ii) reducing of global cess and increasing the price of sugar on the local market so as to enhance the overall revenue of producers;

(iii) facilitating conversion of land whenever possible to enable the recouping of costs with a focus on releasing land with the lowest yield;

(iv) Providing incentives to enable sugar companies to restructure their capital with, in view of the level of indebtedness, an emphasis on equity investment including by foreign strategic partners;

(v) Lastly, the possibility as a last resort of sharing risk by Government taking a temporary equity stake to be sold off to investors on the local stock exchange.

197. The right mix of policy measures, the provision of support to producers from the accompanying measures as explained in the following sections and the judicious recourse to bridging finance are expected to limit financing problems to the strict minimum in the future for those producers that are going to stay in business and produce the 4.75 M tonnes of cane referred to above.

H.2 Price of sugar on the local market

198. Ever since 1995, the MSS imports sugar and sells it on the local market at the institutional prices which are lower than the import price. The average yearly loss of the MSS over the last twelve years is Rs120M.

199. In 2005, Rs360M were lost and in 2006 it is expected that nearly Rs500M will be lost. The average figure represents 3.2M€ or nearly 25.6M€ or Rs 960M over the 2008-2015 eight year period. Losses would be much higher, if the figures for the recent years are taken into account. For a yearly loss of Rs300M or 8.1M€, figures for 8 years come to Rs2.4bn.

200. An increase of the price of sugar on the local market in a phased manner i.e over three years namely 2006 to 2008 to cover yearly losses of Rs 300M would also address the non transfer of certain cess items to Government .

H.3 Labour issues

201. With the implementation of the two VRS schemes, the sugar producers will at specific times of the year (e.g. harvest/replanting) need to have recourse to seasonal labour. In current circumstances, this recourse is constrained. It is proposed that the constraints be lifted. This measure will in no manner whatsoever affect the acquired rights of those in employ in the sugar industry.

202. **More flexibility in the use of seasonal labour** would facilitate the management of regrouped units in the context of cane cultivation agreements.

203. Under Section 23(3) of the SIE Act 2001, any producer has, in making a VRS offer, to effect same to all employees above the specified age (50 and 55 or 45 and 50). In the case of a miller who is destined to remain in operation, this provision of the Act would lead to a situation where all the skilled workers would opt for the VRS and the factory would be left only with young and unskilled workers. It is to be noted that circumstances in the field and factory are quite different. In the former, the employees are semi-skilled and work output decreases with age, whereas in the latter, the skill of the workers increases with age.

204. Accordingly, there is need to allow such millers to effect the choice of the employee to whom the offer of an early retirement scheme (**ERS**) would be made,

however, the employee would have the right to accept or reject the ERS offer. Some 300 employees could be concerned.

205. The implementation of the VRS would be accompanied in all producing entities by a **substantial reduction of overheads.**

H.4 Adaptation and empowerment

206. Both the VRS and the Blue Print make provision for the grant of scholarships to the children of employees having voluntarily terminated their contract of employment. This practice is being continued and additional means are being provided to ensure that the children of these employees are not hampered in their quest for better education.

207. From the overall perspective there is need to put in place an adaptation and empowerment policy to ensure that those employees who lose their jobs can be retrained with a view to either their redeployment to other sectors or to their starting up small enterprises in the agricultural and non agricultural sectors. The reskilling would be done prior to an employee leaving in the context of the VRS 2. Assistance for enterprise creation would be in the form of support from the Empowerment Fund being set up by Government in May 2006 together with reforms to encourage registration of small firms to obtain credit and with a reduction of the administrative burden for compliance with rules and regulations. A well monitored Small and Medium Enterprise programme could also lead to significant job creation and this would be one further element of the pro poor strategy.

208. Employees above a certain age who accept the VRS are entitled to the early receipt of the contributory retirement pension but at an actuarially calculated reduced rate. Thus a person aged 50 would receive 60% of his/her retirement pension. Under the VRS 1 the cut off ages to receive pension were 50 years for women and 55 years for men. In VRS 2, the cut off ages will move to 45 and 50 years respectively. The age to receive actuarially reduced pension would move correspondingly.

209. The effects of the reduced pension are more pronounced in the case of women for three reasons:

(i) their basic salary is lower than for men on account of the wage packages and remuneration orders prevailing in the sugar industry;

(ii) they retire younger 45 or 50 years as opposed to 50 or 55 years for men and the actuarial factors used to compute retirement pension are lower;

(iii) they are often widows or are the only bread earner in cases where the husband is unable to work.

210. Accordingly, there is need to provide support to women retiring voluntarily through the VRS 2 and who have retired in the VRS 1.

211. The Sugar Sector Strategic Plan 2001-2005 made provision for the setting up of a Training and Modernisation fund for Trade Unions and an amount of Rs 5.0 million was raised from cess. This time yearly amounts would be provided to the Trade Unions to facilitate their adaptation to the new circumstances from the adaptation and empowerment schemes.

212. To enable the objectives spelt above including the need to provide support to women affected by the VRS to be met an amount of Rs 800 M is being included in the Action Plan 2006-2015 for adaptation and empowerment. These funds would go to safety nets, possibly in a revamped Social Aid program (as part of broader welfare reform), to augment the resources of the Empowerment Fund and to finance technical assistance by Enterprise Mauritius, SEHDA and the MSA to facilitate the creation of SMEs and their registration to benefit from access to financing vehicles. To ensure greater ownership by the employees, trade unionists would be involved in discussions on the allocation of funds and monitoring to ensure impact.

H.5 Early retirement pension for factory employees having voluntarily terminated their contract of employment.

213. While VRS 1 comprised the possibility of the early receipt of contributory retirement pension, no such provision in the case of the Blue Print. Legislation is being amended to extend this possibility to employees covered by the Blue Print.

H.6 Procedures to facilitate access to and use of land

214. Employees having voluntarily terminated their contract of employment are entitled to a plot of land to build their houses. However, owing to lengthy procedures, the employees receive their land with significant delay. Measures legislative and administrative are being taken to ensure that the employees receive their land with the least delay. Moreover, discussions are underway on land use to explore the possibility of small holders and recipients of land under the VRS to pool land; to make it available for commercial purposes as part of a land use master plan to be developed to accommodate the wider economic restructuring program, particularly for the new economic pillars.

H.7 Marketing of Sugar

215. The MSS in collaboration with the MSA is evolving a comprehensive marketing strategy where value added, necessarily coupled with a very aggressive marketing approach, will be secured:

(i) In absolute terms, through expanded sales of direct consumption sugars, special and white; actual level of sales will depend on market opportunities, existing or to be created;

(ii) In relative terms, through inter alia a better mastery of the value added chain including:

(a) maximizing local value added through packing via either centrally located or sugar factory sited packing plants;
(b) moving further up market in products including a branding strategy that would capitalize on the image of Mauritius as a sugar and holiday haven;
(c) rigorous quality control; through HACCP (Hazard Analysis Critical Control Point) production norms i.e. zero defect

I. Viability and sustainability of the Action Plan[27]

I. 1 Project Profitability

216. While the Action Plan has the potential to ensure the future viability of the industry's core activities — growing and milling cane to produce bulk raw sugar — it will nevertheless require considerable investment in the sector. The total cost of the Plan is estimated to be Rs25 billion. Table 8 summarises the costs associated with implementing each project, as well as each project's estimated financial return (IRR and NPV).

217. When deriving NPVs and IRRs, cash flows have excluded any financing cost as the projects are being appraised on a stand-alone basis. Projects that have positive NPV and IRR in excess of the cost of debt (12% in MUR) are deemed to be bankable and the projects can raise finance to invest. Table 10 below shows the outcome of this analysis.

Table 10: Estimated Cost and Returns of Implementing the Accelerated Action Plan

	Investment Cost	Financial Returns [1]	
		NPV	IRR
	Rs billions	Rs billions	%
Field Operations	3.5	0.8	42%
Difficult Areas	0.4	n.a.2	n.a.2
Centralisation	2.9	0.9	27%
Power Plants	10.3	4.7	23%
Ethanol Production [3]	0.6	0.2	30%
VRS II	3.6	-1.0	5%
Debt servicing support	1.5	n.a	n.a
Restructuring of CESS	0.9	n.a.	n.a.
Research	0.5	n.a.	n.a.
Social safety nets and contribution to Empowerment Fund	0.8	n.a.	n.a.
Total	**25.0**		

Notes: 1. All projects have been evaluated using a discount rate of 15% except Power Plants (for which 12%has been used) and Indebtedness (7%).
2. n.a. = not applicable.

[27] Further details are to be found in chapter 5 of Annex 1

3. The return on the ethanol project assumes that ethanol is produced for sale as part of a fuel ethanol programme, with world oil prices of around US$40 per barrel.

Basic document from LMC amended by MSA to include debt figures, Adaptation and Empowerment Fund and Ethanol figures to reflect production of anhydrous ethanol

218. Not all projects (notably VRS II) offer commercially acceptable returns in the short term. Moreover, the high level of indebtedness of the estate and milling sectors is a constraint for them to secure funds to implement projects.

219. Yet, if the industry is to reduce the costs of its core activities sufficiently to ensure that it has a sustainable future, it will have to adopt the main projects identified in the Action Plan and in particular those that have the greatest impact on reducing the cost of producing sugar namely field operations, centralization and VRS II.

220. **Field Operations.** The greatest return is in the mechanisation of field operations, because: (a) investment costs are low in relation to labour savings; and (b) it is not influenced by the future level of EU sugar prices. However, to implement greater mechanisation it is necessary to carry out extensive further de-rocking, which does not, in itself, have a positive rate of return. The financial attraction of irrigation is also negative.

221. **Centralisation**: This project has the single greatest impact on production costs. Although the returns on the project are attractive, the high cost of worker compensation and investment in incremental capacity are still significant.

222. **VRS II**: VRS II is not financially attractive. However, it is an important element of the Accelerated Action Plan from both an economic and social perspective. This is because it makes it possible for estates to mechanise field operations, which would not be possible if the vast majority of workers remained as permanent employees.

223. If the country is to mitigate the economic impact of EU policy reform (notably on foreign exchange earnings) and fulfil the Plan's broader social and environmental objectives, it will also need to retain production in difficult areas, which will not, in itself, lower the cost of producing sugar.

I.2 Revenue and export earnings

224. Although the implementation of the 2006-2015 Action plan is expected to allow the sugar industry to remain viable in the future, it will only be able to mitigate partially the adverse effects of a dramatic reduction in the EU price. Table11 hereunder shows the current and future contribution of the sugar cane cluster.

Table 11: Current and Future Contribution of the Sugarcane Cluster to Revenue

	Current 2003	Future 2015	% Change
1. Sugar			
- Rs millions	5,021	3,237	-36%

- % GDP	3.7%	2.4%	
2. Molasses			
- Rs millions	146	0	-100%
- % GDP	0.1%	0.0%	
3. Ethanol			
- Rs millions	0	458	-
- % GDP	0.0%	0.3%	
4. Cogeneration2			
- Rs millions	444	1,581	256%
- % GDP	0.3%	1.2%	
Total			
- Rs millions	**5,611**	**5,276**	**-6%**
- % GDP	**4.1%**	**3.9%**	

Note: 1. GDP in the future is assumed to be current GDP, adjusted for any change in the contribution of the sugarcane cluster, taking into account the multiplier in the sugar sector, which is estimated at around 1.5.

Source LMC

225. The contribution of the cluster can also be analysed from the foreign earnings perspective as shown below in table 12.

Table 12: Current and Future Contribution of the Sugarcane Cluster to Net Export Earnings (Rs million)

	Current 2003	Future 2015	% Change
Foreign Exchange Inflows			
Sugar Exports	8,704	6,019	-31%
Molasses Exports	146	0	-100%
Coal Imports saved1	883	1,011	14%
Gasoline Imports Saved2	0	328	-
Foreign Exchange Outflows			
Sugar Imports	303	307	1%
Imported Inputs in Sugar Production	1,309	1,418	8%
Imported Inputs in Cogeneration	216	579	168%
Net Inflows	7,905	5,055	-36%
% National Export Earnings	**34%**	**22%**	

Note: 1. This figure includes an allowance for the savings accrued to sugar millers from being able to power their mills by burning bagasse rather than importing fossil fuels.

2. The value of gasoline savings is based on a c.i.f. gasoline price of Rs11.7 pr litre, which corresponds to a world oil price of around US$40 per barrel.

Source LMC

I. 3 Future Contribution to Employment

226. Although the second phase of VRS and centralisation will reduce the number of workers employed in the industry, the sugar sector is projected to remain an important source of employment following the implementation of the Action Plan. While it is

difficult to estimate the future level of employment due to factors such as greater mechanisation, Table 13 shows the expected reduction in the permanent workforce as a result of VRS II and mill centralisation.

227. The implementation of VRS II is expected to result in around 6,000 agricultural and non-agricultural workers leaving the industry. However, it should be noted that many of these workers may be replaced with workers employed on a seasonal basis in the short term. Over time, however, it is expected that these seasonal employees will be reduced in number.

228. Centralisation is projected to result in around 1,200 redundancies, although the expansion of Savannah will provide a small number of new jobs. The construction of two new power plants would also provide more jobs.

229. Lastly, the scaling down of cess-funded institutions may also lead to a small number of job losses. However, it is difficult to quantify these at this stage.

230. In addition, there are estimated to be around 3,000 workers employed in the transport sector, and a further 15,000-20,000 workers employed in sectors indirectly linked to the sugar industry. The full implementation of the action plan should ensure that the vast majority of these jobs are retained.

Table 13: Future Reduction in the Sugar Sector Workforce

Current Sugar Workforce	41,355
Labour force reductions:	
VRS II	6,000
Centralisation	1,164
Future Sugar Workforce	34,191

Source: LMC

I. 4 Future Contribution to National Energy Requirements

231. The further development of cogeneration is projected to increase the contribution of bagasse to national energy requirements. This is summarised in Table 14, which shows that electricity production from bagasse will increase significantly, although growth in electricity demand over the next decade will mean that its contribution to national electricity requirements will increase to around 20%.

Table 14: Current and Future Contribution of the Sugarcane Cluster to National Energy Requirements (GWh)

	Current 2003	Future 2015
Electricity from Bagasse (GWh)	296	600
Total Demand (GWh)	1,840	3,100
% Total Demand	**16%**	**19%**

Source: LMC

I .5 Future Environmental Benefits

232. From an environmental perspective, the sugar cane industry has a relatively low environmental impact in comparison to other land-uses, for example in regard to relatively low agro-chemical inputs, soil conservation qualities and availability of cost-effective wastewater re-use and recycling technologies. It can therefore contribute quite significantly to environmental protection. The environmental life-cycle benefits of sugar cane are also significant, in that almost all of the by-products and waste streams can be utilised in some way, e.g. bagasse/cane trash for power generation, filter cake/combustion ash as a soil conditioner, molasses for the production of bio-fuel, vinasse for fert-irrigation and composted or incinerated vinasse as fertiliser.

233. Implementation of the Action Plan will help to preserve these benefits, to which there are a number of additional ones that will arise from the plan activities themselves. For example, re-grouping of land under the field operations will provide an opportunity for improved soil and water conservation practices to be introduced more widely amongst small growers on the island, and the closure of older polluting factories during centralisation and introduction of clean technologies and processes at the remaining ones will help to reduce the environmental impacts from the milling sector. Furthermore, both local and potentially global environmental benefits will arise from improved stack emission controls within the power generation sector and the increased use of renewable fuels such as bagasse (assuming sufficient bagasse is burnt to offset the CO_2 emissions from increased use of coal in co-firing). Global environmental benefits may also arise from the local production of ethanol as a fuel substitute. Finally, the maintenance of production in difficult areas will help to control and manage the risk of soil erosion in upland areas.

I. 6 Future Social Benefits

234. The sugar industry has always contributed significantly to social development and welfare on Mauritius through its central role as a service provider to rural communities.

Despite the planned closure of seven sugar mills over the next 10 years, implementation of the blueprint for centralisation will ensure that essential services (in the form of housing, healthcare, education and training, recreational facilities and technical (e.g. financial assistance) are still provided for a period of three to five years following closure. These services will be gradually transferred to the government and local authority, along with the maintenance of infrastructure in the form of roads, telecommunications and other public utilities.

235. The cash and in-kind compensation given to workers as part of VRS and factory closure contribute positively to the financial security of those living in rural communities. The financial compensation is generous when compared with other sectors providing a financial buffer prior to retirement (in most cases) or new employment. The provision of land is also highly valuable, providing a means to grow subsistence crops and/or to build a house, whilst at the same time being an asset that can be handed down to heirs.

236. Closure of mills will result in a reduced workforce, but seasonal employment opportunities will exist and training is also available for those who wish to acquire skills in other fields. The sugar industry has also put in place mechanisms to try and ensure that the benefits of sugar filter down and are distributed amongst workers and their dependents. This has been done in a number of ways, for instance through the Sugar Investment Trust (SIT) and via support provided to the various institutions and organisations that underpin the industry and its workforce. Moreover, there are plans to increase the benefits that the workforce receives from sugar cane with a planned increase in the shares that planters have in bagasse energy and ethanol companies. The Trust is also looking at diversifying its investments.

237. Finally, the re-grouping of farmers proposed under field operations, centralisation and maintenance of production in difficult areas, has significant social benefits for small planters by increasing cost efficiency and lowering investment risk. It provides an opportunity for intensification of production and hence increased returns, whilst at the same time encouraging community cohesion and capacity building.

I.7 Multi criteria assessment

238. Table 5.7 in Chapter 5 of Annex 1 provides an extensive analysis of each project from the economic, financial, environmental and social perspectives. Table 15 below is a summarised version.

Table 15: Summary of Economic, Financial, Environmental and Social Impacts

POTENTIAL AREA OF IMPACT	PROJECT PROPOSALS

	1: Field Operations	2: Centralisation	3: Power Plants	4: Ethanol Production	5: VRS II	6: Indebtedness	7: Restructuring of Cess	8: Production in Difficult Areas	9: Research and Capacity Building
Economic Issues									
Reduce Sugar Production Costs	+1	+1	0	0	+2	0	0	0	+1
Availability of Foreign Exchange	0	0	+2	2	0	0	0	0	0
National Employment	-2	-2	+1	1	-2	0	0	+2	0
Financial Issues									
Internal Rate of Return (IRR)	+2	+1	+2	-1	+1	0	0	0	0
Environmental Issues									
Soil conservation	+2	0	0	+2/-1	0	0	0	+2	0
Water quality	-1	+2	-2	-2	0	0	0	2/-1	0
Water supply (availability)	-2	+2	0	0	0	0	0	0	0
Biodiversity (inland and marine)	-1	+1	-1	-2	0	0	0	+2	0
Air quality	+2	+2	+2	-1	0	0	0	0	0
Health and safety	-1	+1	+1	-1	0	0	0	0	0
Noise, nuisance and odour	-1	+1	+1/ -1	-1	0	0	0	0	0
Global environment	0	0	+2	+2	0	0	0	0	0
Social Issues									
Financial security	-2/+2	-2/+2	0	0	-2/+2	0	0	-2/+2	0
Investments	0	-1	0	0	0	0	0	0	0
Demographics and migration	0	-1	0	0	-1	0	0	0	0
Livelihoods and ancillary employment	0	-2/+1	+1	+1	+1	0	-1	0	0
Social cohesion	+1	+1	0	0	-1/+1	0	0	+1	0
Welfare and anxiety	0	-1	0	0	0	0	0	0	0
Training and capacity building	-1	+2	0	0	0	0	0	-1	0

Notes:

- Table indicates potential overall significance of impacts (+2 = very positive; +1 = positive; 0 = neutral; -1 = negative; -2 = very negative).
- Where negative impacts may occur, mitigation measures have been identified by study and/or are already understood to be implemented within sector

Source: LMC

239. In certain cases, ranges e.g -2/+1 have been given as the impact depends on the implementation of mitigation measures. To this end it has to be borne in mind that table 5.7 of Chapter 5 of Annex 1 refers to a matrix type analysis for each project where potential area of impact, outline description of impact and potential mitigation/enhancement measures are related to a variety of issues .

J. Project Costs and funding

240. The cost estimates have moved from March 2005 to March 2006. Table 16 shows these movements and explains the reasons thereof.

Table 16: Reasons for movements in cost estimates

Component	Initial cost M€	Revised cost M€	Remarks
Field Operations Derocking	42	35	Acreage adjusted after experience gathered in implementing regrouping project
Field Operations Irrigation	52	35	Acreage adjusted after experience gathered in implementing regrouping project
Field Operations Mechanisation	25	24	-
VRS 2	47	97	Higher number of employees expected to accept VRS. Moreover cost of infrastructure in respect of land to be given to employees has gone up
Restructuring of cess	25	24	-
Centralisation Capital Expenditure	45	43	-
Blue Print : social costs of closure	24	35	Larger number of workers involved
Power Plant	231	278	More plants being considered as a result of the closure of 7 factories.
Ethanol	-	16	Establishment of two distilleries
Debt Servicing	67	41	Debt has gone down
Difficult areas	28	11	Alternatives to cane production being considered
Research and Capacity building	14	14	-
Contingency/Adaptation and Empowerment Fund	53	22	Contributions for social safety net under revamped Social Aid program and to the Empowerment Fund. No contingency provided.
Total	653	675	

Source: MSA

241. Table 17 shows the implementation details of the various projects

Table 17: Implementation details

Component	Implementation period	Remarks
Field Operations	2006-2015	Equal amounts spent in each year

Derocking		
Field Operations Irrigation	2008-2012	Equal amounts spent in each year
Field Operations Mechanisation	2007-2011	Equal amounts spent in each year
VRS 2	2007-2010	60% i.e cash compensation spent in year one, land infrastructure and minor costs i.e 40 % of total spent in equal amounts in year 2 and 3.
Restructuring of cess	2007-2008	Equal amounts spent in each year
Centralisation Capital Expenditure [28]	2005-2008	As per schedule given by promoters
Blue Print : social costs of closure	2006-2013	Cash compensation (64% of total costs) in year one, land infrastructure costs (28% of total) in years 2 and 3 and planters' funds (8% of total) from year 1 to 5.
Power Plant [29]	2005-2012	Investments span 30 months with 15% being effected in the first year, 60% in the second and 25% in the last year
Ethanol	2008-2009	Equal amounts spent in each year
Debt Servicing	2007-2010	Equal amounts in each year
Difficult areas	2008-2015	Equal amounts spent in each year
Research and Capacity building	2007-2015	Equal amounts spent in each year
Contingency/Adaptation and Empowerment Fund	2007-2012	¼ of amount in 2008-2011 and 1/8 in the other years
Total		

Source MSA

242. The yearly requirements of the Action Plan have been worked out as shown in Table 18. It appears therefrom that 87 % of the Rs 25 billions will have to be spent on or before 2010. The requirements of 2007 to 2009 represent 58% of the total.

[28] Work on increasing factory capacity has started
[29] Work started in 2005

Table 18: **Requirements of the Sugar Industry on a calendar year basis**

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total	% to Total
	Figures in Rs M												
Field Operations Derocking	-	130	130	130	130	130	130	130	130	130	130	**1300**	**5.2**
Field Operations Irrigation	-	-	-	260	260	260	260	260	-	-	-	**1300**	**5.2**
Field Operations Mechanisation	-	-	180	180	180	180	180	-	-	-	-	**900**	**3.6**
VRS	-	-	1080	1440	720	360	-	-	-	-	-	**3600**	**14.4**
Restructuring of cess	-	-	450	450	-	-	-	-	-	-	-	**900**	**3.6**
Centralisation Capital Expenditure [(1)]	300	1100	100	100	-	-	-	-	-	-	-	**1600**	**6.4**
Blue Print:social cost of closure	-	113	495	258	301	76	48	6	3		-	**1300**	**5.2**
Power Plant	540	2415	1920	965	2160	1110	840	350	-	-	-	**10 300**	**41.2**
Ethanol	-	-	-	300	300	-	-	-	-	-	-	**600**	**2.4**
Debt Alleviation	-	-	375	375	375	375	-	-	-	-	-	**1500**	**6.0**
Difficult areas	-	-	-	50	50	50	50	50	50	50	50	**400**	**1.6**
Research	-	-	63	62	63	62	63	62	63	62	-	**500**	**2.0**
Social safety nets and contribution to Empowerment Fund	-	-	100	200	200	200	100		-	-	-	**800**	**3.2**
Total Yearly	**840**	**3758**	**4893**	**4770**	**4739**	**2803**	**1671**	**858**	**246**	**242**	**180**	**25 000**	**100.0**
Yearly % of total	**3.4**	**15.0**	**19.6**	**19.1**	**19.0**	**11.2**	**6.7**	**3.4**	**1.0**	**1.0**	**0.7**	**100.0**	

[(1)] Additional cost of cane transport following a factory closure has not been taken into account.

Source: MSA and LMC

243. Given the low level of accompanying measures, it is essential to carry out a prioritisation exercise and in this regard, consideration has been given to the following:

(i) **first ranking** to those projects that have both the economic and social dimensions: VRS, social costs of factory closure, enhancement of the competitiveness of planters; revenue support in difficult areas, cess reduction and the provisions for the social safety net under a revamped Social Aid program and contributions to the Empowerment Fund;

(ii) **second ranking** to projects relating to the energy dimension of sugar cane due regard being had to the possibility of obtaining funds from banks, the local stock exchange and strategic foreign investors and in this context, the priority works out in the following sequence given in descending order: research in cane biomass, ethanol production and electricity generation. **Funds for energy projects** i.e. ethanol and electricity would in principle be sought from other sources i.e. EU-ACP Energy Facility;

(iii) **third ranking** in respect of support to alleviate the debt burden of those companies that are financially constrained having regard to a market oriented restructuring based on attracting equity;

(iv) projects such as capital expenditure undertaken by the Corporate Sector in respect of factory modernization, land preparation, mechanization and irrigation would be met by the producers through loan and own resources.

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244. On the basis of these rankings, the following arrangements emerge:

(i) Producers undertaking the VRS would have to meet some 30% of the total costs;

(ii) Up to 75% of social costs of factory closures would be eligible for funding under accompanying measures;

(iii) Revenue support for planters/metayers in difficult areas would be funded from accompanying measures;

(iv) A large part of the requirements in respect of the Social safety nets and the Empowerment Fund would be met from accompanying measures;

(iv) Derocking and irrigation costs would be eligible for funding under accompanying measures with priority given to the former given that funds for irrigation projects can be obtained bilaterally;

(v) Between 2/3 to the totality of cess reduction costs can be met from accompanying measures;

(vi) Research depending on the level of funds received could be met from accompanying measures;

(vii) Given the importance of ethanol, there is merit in securing part of the capital cost of the ethanol distilleries from the accompanying measures and part from the ACP-EU Energy Fund;

(viii) Debt servicing could have a higher ranking depending on the level of accompanying measures available but would be in the form of transforming debt into equity later sold on the stock market;

(ix) Support to the co-generation projects will bring about a reduction of the cost of electricity, accordingly, part of the capital expenditure would be met from the ACP-EU Energy Fund and/or accompanying measures;

(x) Capital expenditure costs for factory closure, field mechanization and mechanical harvesting would be met from loans contracted from local banks.

245. Funding would be sought from various sources as indicated in table 19.

Table 19: Funding the projects of the Action Plan (Source MSA)

Component	Amount required M€	Accompanying Measures	ACP/EU Energy Fund	Other ACP/EU Funds	Private Sector/Producer Funding	Bilateral Sources
Field Operations Derocking	35	Yes	-	-	Yes	-
Field Operations Irrigation	35	Yes	-	Yes	Yes	Yes
Field Operations Mechanisation	24	-	-	-	Yes	-
VRS	97	Yes	-	-	Yes	-
Restructuring of cess	24	Yes	-	-	Yes	-
Centralisation Capital Expenditure	43	-	-	-	Yes	Yes
Blue Print	35	Yes	-	-	Yes	-
Power Plant	278	Yes	Yes	-	Yes	Yes
Ethanol	16	Yes	Yes	-	Yes	Yes
Debt Servicing	41	-	-	-	-	-
Difficult areas	11	Yes	Yes	Yes	-	-
Research	14	Yes	Yes	Yes	-	-
Social safety nets and contribution to Empowerment Fund	22	Yes	-	Yes	-	Yes
Total	**675**					

246. Assuming the full implementation of the Plan, a sugar production of 520 000t, a significant reduction of overhead costs and the alleviation of the financial burden of the industry the most difficult years would be **2007 to 2010.** These years are those when the **major part** of the investment in the context of the Action Plan has to be made.

247. The difficulties of the 2007-2010 period are compounded by the fact that there is a time lag between an investment and the flow of the stream of benefits derived therefrom. This is particularly true in the case of the significant investments that are incurred in respect of sugar factories and power plants. Moreover, the development of markets and access thereto for value-added products takes time.

248. There would be the need to have recourse to bridging finance in the 2006 to 2010 period and in particular the 2007-2009 one. For the projects involved, the following is relevant:

(i) the MSA can raise loans for purposes of the cess reduction and research projects and interest costs would be met from cess;

(ii) the derocking project involves a multitude of producers and as was the case in 2005, it would be appropriate for the MSA to raise a loan with Government guarantee paid for with a risk premium payment that can be backloaded to when viability is established and interest costs would be met from the accompanying measures or from cess or from a mixture of both; for 2005/06, a Rs500M loan has been raised by the MSA with Government guarantee;

(iii) the VRS costs and the Blue Print costs involve a lesser number of large operators and in this case two options are available:

(a) the extension of the 2001 VRS Bank of Mauritius line of credit to cover the VRS and Blue Print costs; or
(b) the raising of a loan by the producers with interest costs being borne by them;

(v) these projects have little or no forex component and accordingly it would be better that bridging finance be denominated in Rupee terms.

K. Monitoring

249. The support under accompanying measures would come in the form of general budget support. The funds will be managed with the same rigour and highest standarrds of financial good governance as for other elements of the Mauritius budget. The Director of Audit, whose independence is guaranteed under the Constitution of Mauritius, will audit the accounts relative to the accompanying measures.

250. The monitoring of budgetary performance would be undertaken on the basis of performance indicators to be jointly agreed between Government and the Commission's delegation in Mauritius. The indicators would have to be consonant with the objectives of the Plan and be sufficiently flexible to accommodate the specificities of sugar in Mauritius.

251. At implementation level, there would be a three tier approach, namely:

(i) **Overseeing the whole plan**. A High Powered Committee chaired by the DPM would oversee the whole plan and review on a regular basis the targets and objectives of the plan in the light of circumstances.

(ii) **Institutional coordination for major and comprehensive projects**. The Minister of Agroindustry would chair the coordination committee. This committee would also ensure interaction with stakeholders.

(iii) **Detailed implementation follow up**. This task would be undertaken by the MSA which would also ensure the technical and administrative back up for the above committees. Pursuant to Section 16 of the MSA Act, special funds for purposes of channeling financial resources to the industry will be set up. The staffing and organization of the MSA will be reviewed and upgraded to enable it to fulfill its task.

252. The Action Plan would be **reviewed** in 2009 to assess its implementation and its relevance to the market environment. Modifications if necessary would be effected.

L. Conclusion

253. Never has Mauritius faced the odds it is facing now. It is confronted with a very difficult economic and budgetary situation and has also to preserve social harmony in such difficult times.

254. The whole economic set up of Mauritius has to be reviewed and Government is tackling the issue from the overall level through the Country Strategy Paper and the sectoral level through adaptation plans. In the case of sugar, a bold, deep and comprehensive Action Plan aiming at addressing the sugar and energy shocks has been prepared.

255. Sugar has been associated with Mauritius over some 367 years and it has shaped every aspect of the history and culture of this country. Moreover, through its multifunctional role, it spans the economic, social, energy and environmental domains and is linked to the development of agricultural diversification and the tourism and services sectors. It has furthermore played a key stabilizing role through direct and indirect employment opportunities and through the distribution of the proceeds derived from the sale of sugar under the Sugar Protocol.

256. Accordingly, the formulation of a bold, deep and comprehensive Action Plan which aims at transforming the sugar industry into a sugarcane cluster has been a lengthy and painstaking exercise.

257. To ensure that all interests are heard and understood, Government has engaged in a dialogue process on the principle of a bottom-up approach purporting to achieve consensus and the full ownership of the Multi Annual Adaptation Strategy by all stakeholders. The consultation/dialogue has been fruitful and the strategy is now widely accepted by all stakeholders.

258. Government has had to reconcile economic, social, distribution, energy and environmental considerations. Accordingly, the Action Plan 2006-2015 represents a delicate balance which has to be viewed from a global perspective

259. The Plan comprises a wide array of measures as indicated hereunder:

(i) The transformation of the sugar industry into a sugar cane cluster;

(ii) the maintenance of a sugar production of 520 000t which would enable the country to fulfill its international commitments in respect of the Sugar Protocol and the US Global Import Quota;

(iii) the adoption of a very aggressive marketing strategy which would bring down the proportion of raw sugar in total sales from 85% to less than 50%;

(iv) the establishment of four sub-clusters at Belle Vue, FUEL, Médine and Savannah;

(v) the closure of seven out of the eleven factories resulting in three factories producing more than 100 000t of sugar, two of which would produce more than 150 000t of sugar; some 1200 employees would be involved;

(vi) the commissioning of four 42MW/82 bar and one 35MW/82 bar efficient bagasse/coal firm power plants producing electricity year round;

(vii) the promotion of the use of cane field residues as combustible in bagasse/coal power plants to displace coal;

(viii) the commissioning of two distilleries at FUEL and Savannah to produce some 30M litres of ethanol from 120 000t of molasses thereby enabling a 20/80 blend between ethanol/gasoline; in this regard, a blending policy is being formulated;

(ix) the increase of the acreage free from rocks from 50% to 81% to total land cultivated;

(x) the increase of the extent of land being subjected to mechanised operations, thus mechanical harvesting would move from 21% to 55% of the total area under cane;

(xi) an additional amount of 7000 hectares would be covered by irrigation projects;

(xii) regrouping of small planters representing some 20% of cultivated land with a view to increase yields by some 20% and reducing costs by some 20% would be effected on some 12 000 hectares of land with the close involvement of millers, stonecrushers and specialized institutions;

(xiii) the introduction of higher cane and sugar yielding varieties in particular on the lands of small planters;

(xiv) the improvement of the 2001 Voluntary Retirement Scheme in three aspects, namely the lowering of the cut off age for entitlement to the highest level of compensation per year of service and to early receipt of the contributory retirement pension; the increase of the compensation package to younger workers; and the introduction of a reskilling scheme; some 6000 employees would be involved;

(xiv) the establishment of procedures to revamp Social Aid into an effective social safety net and contributions to the Empowerment Fund set up in May 2006 which would cater for technical assistance and financing to reskilled employees wishing to set up small enterprises; the special needs of women; the adaptation of Trade Unions; and the greater provision of scholarships to children of employees having lost their job in the context of the reform of the sugar industry;

(xv) legislative amendments to enable relevant employees affected by factory closures to benefit from early receipt of the contributory retirement pension;

(xvi) facilitation of the use of seasonal labour;

(xvii) recourse to Early Retirement Schemes in the case of sugar factories remaining in operation;

(xviii) reduction of administrative and legislative constraints to the obtention of land by employees having voluntarily terminated their contract of employment;

(xix) an economic and environmental package for difficult areas comprising incentives to those remaining in cane cultivation, reforestation or the cultivation of environment friendly crops in the case of land moving out of cane and incentives for the development of eco-tourism and IRS projects;

(xx) reduction of the global cess by a significant amount, Rs200 M or Rs300 M yearly;

(xxi) cost reduction at the level of the Mauritius Sugar Syndicate, the Sugar Insurance Fund, the Bagged Sugar Storage and Distribution Company and the Irrigation Authority;

(xxii) elimination of the loss incurred by the Mauritius Sugar Syndicate on sale of sugar on the local market;

(xxiii) promotion of research and development in respect of firstly, high quality canes (high sucrose content) and high fibre canes and secondly, more efficient combustion of bagasse;

(xxiv) recourse to bridging finance will be facilitated and the search for equity financing to relieve the debt situation will be encouraged;

(xxv) the accompanying measures would come in the form of budget support; monitoring thereof would be undertaken on the basis of performance indicators to be jointly agreed between Government and the Commission's Delegation. The indicators would have to be consonant with the objectives of the Plan and be sufficiently flexible to accommodate the specificaties of sugar in Mauritius;

(xxvi) the rigour and the highest standards of financial good governance will apply to the use of the funds accruing under accompanying measures;

(xxvii) the audit in respect of the use of the accompanying measures would be effected by the Director of Audit whose independence is guaranteed under the Constitution of Mauritius;

(xxviii) the monitoring of implementation would be undertaken in a three tier system comprising the overseeing of the whole plan, institutional coordination for major and comprehensive projects and detailed implementation follow up;

(xxix) the overhaul of the Sugar Industry Efficiency Act 2001 to translate the measures of the Action Plan into legislation;

(xxx) the reinforcement, if required, of legislation and administrative procedures to ensure that environmental and health and safety norms are fully adhered to;

(xxxi) the tempo of lobbying action will be maintained to ensure that adequate amounts of funds are secured under the accompanying measures and that disbursements be effected in a front loaded manner.

260. The reform undertaken under the Action Plan 2006 – 2015 will not only enable the Mauritian Sugar cane Cluster to sail safely in the future but more importantly safeguard a crop which from 2015 onwards will be an invaluable asset in terms of the production of renewable environment friendly energy, and which has the potential of being an efficient multiproduct biofactory for the production of high value-added products including proteins, pharmaceuticals, vaccines, polymers and textiles. It is to be noted that of all cultivated crops sugar cane is one of the most efficient converter of solar energy into renewable biomass.

Ministry of Agro-Industry & Fisheries
18 April 2006

Annex 2

An example of a Cluster: developments at Savannah competitiveness by world standards

The ongoing developments in respect of the cluster at Savannah are very comprehensive as illustrated below. Developments at FUEL would to a large extent follow the same pattern:

(i) the closure of St Felix as from the end of the 2005 crop, the closures of Riche en Eau and Mon Tresor as from the end of the 2006 crop and the the closure of Union St Aubin as from the end of the 2007 crop;

(ii) the expansion of the existing Savannah factory to one operating at 425 TCH (tonnes cane per hour) factory using cane diffusion technology as well as energy saving equipment. This factory would mill some 1.65 million tonnes of cane to produce some 185,000 tonnes of sugar and some 45 to 50,000 tonnes of molasses;

(iii) the sugar factory would have the possibility to produce white sugar of EEC grade 2 sugar, this type of sugar is the one marketed in the EU; it would also be able to produce refined sugar of up to 100 ICUMSA;

(iv) there would be production of special sugars, the installations used to produce specials at Mon Tresor would be transferred at Savannah and upgraded;

(v) The installation of packing and container facilities will be envisaged in the context of the marketing strategy being evolved by the Mauritius Sugar Syndicate in consultation with the MSA;

(vi) the commissioning of two 42MW/82 bar coal/bagasse firm power plants in 2007, pursuant to a Power Purchase Agreement signed between the Compagnie Thermique de Savannah (CTSav) and the CEB;

(vii) the commissioning of a further 42MW/82 bar coal/bagasse firm power plant in 2008; this plant is in line with the power/capacity demand worked out by the CEB for 2008;

(viii) the three 42MW/82 bar units would export some 625 GWh to the grid, some 200 from bagasse and some 425 from coal i.e. in a 32:68 ratio; the use of bagasse avoids the import of some 110.000t of coal;

(ix) the installation of a dry cane cleaning plant at Savannah. Such a plant allows the separation of canes from leaves and trash, the milling of the cleaned canes is better in terms of sugar recovery and energy saving while

the leaves and trash provide more combustible to generate electricity. This technology was conceived by the MSA and jointly experimented by the MSA, the MSIRI and Union St Aubin in the context of an environmentally friendly project funded by a grant under the Global Environment Facility (GEF);

(x) the installation of an ethanol distillery, with appropriate vinasse treatment facilities, which can produce some 25 million litres yearly. Initially, the distillery would operate in the crop season and produce some 12.5 million litres of ethanol using all the molasses obtained from the canes milled at Savannah.Depending on the price of oil, the use of cane juice to produce ethanol can be envisaged;

(xi) The offer of an **Early Retirement Scheme** to those employed by Savannah. The blueprint is not applicable to employees of a factory which remains in operation.

Annex 3

Documentation available

The following documents are relevant to understand the Mauritian sugarcane cluster in its local and international dimensions:

(i) The Commonwealth Sugar Agreement;
(ii) The Sugar Protocol signed at Lomé;
(iii) The Cotonou Agreement;
(iv) The Sugar Sector Strategic Plan2001-2005;
(v) The Sugar Industry Efficiency Act (amended) 2001;
(vi) The Acts, annual reports and technical reports of the Service Providing Institutions, the Mauritius Chamber of Agriculture, the Mauritius Sugar Syndicate and the Mauritius Sugar Producers Association;
(vii) The WTO Framework Agreement of 2004, the Doha and Hong Kong Ministerial Declarations;
(viii) The EBA initiative;
(ix) The EU Regulations on Sugar;
(x) Working document of the Commission on the Action Plan on accompanying measures for Sugar Protocol countries affected by the reform of the EU sugar regime;
(xi) The Accelerated Action Plan 2005-2015, the Road Map, the first report of Landell Mills Consultants and the second report of Landell Mills Consultants.
(xii) The Sugar Industry Efficiency Act 2001.