

THE INTERNATIONAL MECHANISMS FOR CLEAN TECHNOLOGIES TRANSFER, ACCESS TO THEM AND LIMITATIONS. CUBAN NATIONAL EXPERIENCES.

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INTRODUCTION.

The issue of clean or environmental sound technology transfer toward developing countries is one of the litigation points in the debate between the North and the South that it is developed with more controversy at the international meetings that approach the problem of sustainable development. No matter the angle from which it is focused, each meeting will have present the claim of the South to achieve the flow, under concessional conditions, of the clean technology that the developing countries need to guarantee, jointly with other factors, an appropriate level of environmental health.

As it is well known, in the debate on the trade and environment this question is manifested in more than one of the points in its agenda, specially when the topics relative to the Trade Related Intellectual Property Rights are analyzed, which are perceived by most of the developing countries as a stop to technology transfer. In the same way, when analyzing the role of liberalization in sustainable development, the need to guarantee the access to environmentally clean or sound technologies arises in the debate.

An aspect that is indissoluble tied to technology transfer is finance. How far the affluence of new and additional resources toward our economy go, will be the increase of the possibility to accede to the technologies that we need as developing countries.

For this reason, in our work, after considering the mandates given in Chapters 33 and 34 of the Agenda 21 on Financial Mechanisms and Technology Transfer, and in a way in which we can highlight the methodological and practical links between these two aspects of sustainability, and after sketching the mandates given by the Multilateral Agreements on environment regarding technology transfer, we will analyze the financial mechanisms that facilitate them.

In this sense we try to differentiate, within the Cuban conditions, the multilateral and bilateral sources, since they manifest different tendencies in behavior and influence.

In a second moment we stop to analyze the financial mechanisms that serve to enforce the transfer of environmentally favorable technologies, and the participation of Cuba in them.

In this respect, figures related to the collaboration projects in which the country is involved are valued, as well as the internal and external limitations faced so far.

In this work we conclude that, besides the influence that really has the factors that stop the process of technology transfer, which become worse in the Cuban case as a result of the blockade imposed by the United States of America, there is a need to make a profound analysis of the techniques to access the available international funds for these purposes. This is due to the fact that the mechanisms and procedures are very complex, as well as diverse, causing that in multiple occasions we are lack the needed expertise for the presentation and negotiation of one or several projects and this constitutes an internal barrier to the transfer.

On the other hand it is clear that, in addition, the developing countries should create favorable conditions in their economy which constitutes a to facilitate the entrance and the national development of clean technologies. The national experiences in this respect they will be addressed in the last section of this paper.

This allows us to present, not only the actions toward the stimulation of the use of less polluting technologies, but also to know what else must be done in this trail toward sustainability.

I - TECHNOLOGY TRANSFER IN THE CONTEXT OF AGENDA 21 AND THE MULTILATERAL ENVIRONMENTAL AGREEMENTS (MEAs).

As it has already been said, the achievement of sustainability depends on the accessibility of developing countries to those technologies that may allow combining the economic development with the protection of the environment.

The need to arrive to concrete results in the process of technology transfer goes beyond the policy statements that in this the respect has been done in the 90s. This has been systematically recognized by the Commission on Sustainable Development (CSD) and by the United Nations Conference on Trade and Development (UNCTAD).

This recognition propitiates a favorable movement of technology transfer toward sustainability and also toward the compliance of the mandates of Agenda 21.

How indispensable is the transfer of environmentally favorable technologies is presented in a very clear way in the 1998 edition of the "Report on Human Development". It states that technology is one of the indispensable factors in splitting the economic growth and the use of natural resources and that that processes should be induced that make cleaner productions so that the industry becomes less polluting. Besides, clean and efficient technologies should be developed for waste treatment. It also states that efficient technologies of low cost must be available.¹

Since 1992, with the adoption gives the Agenda 21 in Rio de Janeiro, Brazil, by the principal Heads of State of the World, the global will to fight for the sake of reaching Sustainable Development was reaffirmed. Commitments of international policy were

¹ See: PNUD: Informe de Desarrollo Humano 1998 Pág.83

established for this purpose. These summed up the definitions and fundamental actions to be carried on. Particularly related to Technology Transfer and Financial Resources were Chapters 34 and 33 of the 21Agenda. Let us analyze make a brief analysis of the mandates given in the referred chapters.

In Chapter 34 the transfer of ecologically sound technology is defined as that that is less polluting and uses all the resources in a more sustainable form, recycle a bigger portion of its waste and products and treat the residual waste in a more acceptable way than that technologies that they have substituted.²

In that context when referring to pollution, it affirms that these are technologies for “processes and products” so they don't generate waste or they generate few, in order to prevent pollution, also including those technologies of “final stage” for the treatment of pollution after this has been produced.³

In this Chapter, ecologically sound technologies are conceived as complete systems that include technical knowledge, procedures, goods and services and equipment, as well as procedures for organization and administration⁴

This is why, when in this work we make reference to technology transfer we address the approach of Agenda 21, not only referring to the technology itself, but also to capacity building and institutional strengthening for its appropriate management. However it is necessary highlight that without the properly “hard” technology will not enough, the capacity building and the institutional strengthening, to achieve the sustainability

Of course this international programmatic document recognizes the necessity to adapt technologies to the cultural and historical characteristics of the recipient countries, and to the national interests of those who will receive them. The free determination to the drivers for an environmentally sustainable development cannot be harmed if a political desire exists to have a really effective technological transfer is really effective that doesn't induce non affordable economic disproportion.

The problem of financing is directly related with the possibility to facilitate that developing countries can access these clean technologies. Chapter 33 of Agenda 21 “RESOURCES AND FINANCING MECHANISMS” highlights the link between these and technology transfer when outlining the necessity ,to examine diverse mechanisms of financing, including the volunteers, and to consider the possibility to establish an international special fund and other innovative approaches toward getting, on a favorable base, the most effective and quick transfer to the developing countries of environmentally sound or clean technologies.⁵

² See. Cap.34 art.34.2 pág.636

³ ídem.

⁴ See. Art.34.3

⁵ Agenda 21 Chapter 33 art.33.1 pág. 627

In the same way, the importance of supplying developing countries with effective means, among other things, financial resources and technology, without which it will be difficult for them to fully comply with their commitments and to benefit the common interests of developed and developing countries, the humanity in general and the future generations.⁶

This is why the analysis of the topics relative to the transfer of clean technologies has to go together with the analysis of the financial flows for development.

In a general way and without stopping in the issue, this type of analysis should be preceded by the consideration of the evolution suffered by the Official Development Assistance (ODA), which according to the mandate of the 21Agenda, should reach 0.7% of the GDP of developed countries. Its behavior has been very far from that goal, 0.34% in 1992 and 0.27⁷ in 1995, maintaining a tendency to decline during the whole decade.⁸

The evolution of the international financial flows has been characterized by the primacy given to Direct Investment as the fundamental source of finance for the developing countries, with the corresponding inadequacies and biases, logical, proper of this type of financial resource, from which development toward sustainability cannot rely.

When analyzing this aspect, the study of clean technology transfer faces the lack of the official statistical information that allows in fact evaluating these tendencies. The World Investment Report of 1998⁹ only manages to explain the tendency in the inter-firms agreements in the technological field, which is very far from the true affluence of this type of technologies to our countries.

This difficulty forces us to reorient the study toward the mechanisms emerged from the Multilateral Environmental Agreements (MEAs) and to try to find there the mandates and the practical execution of the claim of Agenda 21 in the topic of technology transfer.

In this respect clear and explicitly we have:

- Convention on Biological Diversity, where articles 16.1 and 16.2 address with clarity the referred mandates related to technology transfer;
- The United Nations Convention on Climate Change, in its articles 4.1 c) and 4.3 respectively, takes into consideration the relative mandate to cooperation, including technology transfer and the appropriate proportionality relative to the necessary new and additional resources to guarantee the transfer toward developing countries.

⁶ idem art. 33.3

⁷ UN- Finance for Sustainable Development. The Road ahead. Proceedings of the Fourth Group Meeting on Financial Issues of Agenda 21. Santiago, Chile .1997 pag.22

⁸ See 8/CSD E/CN.17/1997/2/Add.31

⁹ UNCTAD- World Investment Report 1998 Trends and Determinants UN-1998 pag.28

On the other hand the Montreal Protocol in its article 10 A about technology transfer outlines that each part must take all the feasible and consistent steps with the programs supported by the financial mechanism, to assure:

- (a) that the best technologies, environmentally safe, should be transferred in an expedite way to the parts,...
- (b) That this transfers must be done under the fairest and most favorable conditions.

Finally, although not in an explicit way, the Convention against Desertification and Drought, considers the intention of the cooperation and financing programs in the struggle against this serious environmental problem.

As it is known, technology flows should go associated with financial flows that facilitate them. We will shortly analyze some of these mechanisms.

II - THE FINANCIAL MECHANISMS FOR CLEAN TECHNOLOGY TRANSFER. ACCESS ROUTES AND THEIR USE IN CUBA.

The analysis of financial mechanisms for clean technology transfer, should begin making clear which are the different sources to access them, since they can come from very diverse types.

International collaboration in the environmental field is one of them. In addition are the financial flows from the Official Development Assistance (ODA) or from direct investment, and finally donations from third parts including those from NGOs.

In general sense the Agenda 21 defined as the routes for the implementation of sustainable development the following ones:

- The public and private sectors of the countries.
- For the developing countries, the Official Development Assistance (ODA).
- Substantial new and additional financial resources for sustainable development
- Flows from direct foreign investment and technology transfer through national policies that favor the investments.
- Innovative financial mechanisms to generate new resources from public and private sectors.

This resources come from the following institutions:

- Multilateral Banks for development and funds,
- International Development Association (IDA)
- Regional and Subregional Banks for development
- **Specialized Agencies of the United Nations,**
- **Multilateral institutions for capacity building and technical cooperation**
- Program of bilateral assistance
- Debt relief
- Financing from the private and public sector

As it can be perceived, from the sources of detailed financial resources, many of them depends not only on the domestic political will, but also on external factors, those

which. Cuba only has access to the resources from specialized agencies of the United Nations, and to multilateral institutions for technical cooperation. Of course, in the public sector of the country there are resources assigned to sustainable development, aspect that we will approach later.

It is valid to remind that average annual costs (1993-2000) for the implementation of Agenda 21 in developing countries are above \$600 billions, including near to \$125 billions in donations or under concession conditions terms contributed by the international community.

Of them, an infinitesimal proportion reaches us as financing for our sustainable development programs.

In this work we will discuss briefly the Financial Mechanisms for the environment considered as fundamental for the objectives and spectrum they cover. They are:

- GLOBAL ENVIRONMENTAL FUND (GEF)
- MONTREAL PROTOCOL MULTILATERAL FUND (MPMF)

The Global Environment Fund (GEF).

Regarding GEF, which is jointly administered by UNDP, UNEP and the World Bank, it is underlined that as its resources have an additional character. They are designed to achieve world environmental objectives and they should cover the agreed incremental cost of Agenda 21, particularly for developing countries.

This Fund finances projects consistent with national priorities in the fields of climate change, biological diversity, international seas and depletion of the ozone layer, as well as, activities referred to land degradation, mainly desertification and deforestation, in as much as they relate to the four previous fields.

Allocation of resources from this fund has developed since its creation in three stages or phases with the following characteristics:

- PILOT PHASE (91-94) 860 MMUSD
- FIRST REPOSITION (95-98) 2014 MMUSD
- SECOND REPOSITION (99-02) 2750 MMUSD

As can be appreciated the magnitudes are very far away from the expectations that were raised with the approval of Agenda 21 and of course, assignments to which Cuba has had access are much more distant.

Access of our country to the resources of GEF has behaved until the now as follows:

PROJECTS	AMOUNTS
• FINISHED	2.9 MMUSD
• IN EXECUTION	5.6 “
• APPROVED	4.4 “
• IN NEGOTIATION	14.5 “

It can be appreciated very clearly that with this level of contributions it is not possible to address the changes in the productive structure that will allow development and a generalized introduction of clean technologies, as it is required for the achievement of the sustainable development goals.

Montreal Protocol Multilateral Fund

Established in 1990, it began to operate in 1991, to offer technical and financial cooperation, including the transfer of technologies to developing countries with the approach to help them to comply with the control measures foreseen in the Protocol. It carries out its activity through UNEP, UNDP, ONUDI and the World Bank.

Contributions of this mechanism should be additional and cover, through donations or on concessionaire bases, all the agreed incremental costs on which developing countries incur in the execution of their commitments with the Protocol.

The same as the GEF this Fund has had different stages that are detailed below and where it can be appreciated the level of inadequacy of the resources for the environmental objectives that it seeks to cover.

STAGE	AMOUNT
• FIRST REPOSITION (91-93)	240 MM
• SECOND REPOSITION (94-96)	455 MM
• THIRD REPOSITION (97-99)	466 MM
• FOURTH REPOSITION (2000-02)	440 MM

Like in the previous it can be verified that the resources from this fund are far away the necessary magnitude for compliance with the goals of this Protocol. Likewise it can be appreciated below, that access by Cuba to the resources of this Fund has been minimal.

PROJECTS	AMOUNTS
• FINISHED	476 M USD
• IN EXECUTION	1 858 M USD
• APPROVED	155 M USD
• IN NEGOTIATION	2 665 M USD

In both types of financing sources for sustainable development, the established mechanisms, constitutes in our criteria, a trap, or an approach that hides the real objective of supporting sustainability. This is the concept incremental costs.

The definition and practical application of this mechanisms causes nothing else but to hinder the appropriate fluency of this type of financial help, and it serves itself for the introduction of considerations of a subjective nature that facilitates discrimination of a project or a country.

All these information speaks about financing sustainable development, which does not automatically presupposes that we are in the presence of financing for clean technologies, which makes necessary to screen the information in this respect.

The first attempt to clarify the net resources dedicated to the transfer of clean technologies through international collaboration will be presented bellow.

III - CASE STUDY. THE INTERNATIONAL COLLABORATION

In the case of International Collaboration a database of 700 national projects this type was processed, which despite being in 70% of its accomplishment for their financial information, will allow us to come closer to the current tendencies in the collaboration for the transfer of clean technologies.

Of the 327 projects of collaboration, finished or in execution in the period 95-99, there were 101 projects dedicated to environment, representing 33%.¹⁰

The projects of multilateral collaboration dedicated to the environment represented only 16.2%, while those of bilateral collaboration reached a similar proportion (17.2 %). Nevertheless the assigned financial resources to this projects didn't have the same behavior. The multilateral collaboration represented 45.4% of the resources, while the

¹⁰ See annex

bilateral one represented 6.8%, equivalent to 12,7 MMUSD in the multilateral ones and 1,9 MMUSD in the bilateral.

This analysis corroborates what we highlighted in previous paragraphs about the few possibilities of access to bilateral sources of financing, reflecting the effects of the economic blockade imposed to the country and also the declining and conditioned tendency of the ODA.

The analysis allows also to affirm that in fact, there were 10 projects directed to the transfer of environmentally sound or clean technology adding the multilateral and bilateral collaboration. These represent, 1,8% and 1,2% respectively of the total of projects. The bulk of the projects destined to the environment were directed to capacity building and the institutional strengthening.

The financial resources mobilized to clean technology transfer reach 2803.9 MUSD in the multilateral collaboration projects and 688.0 in the bilateral ones, representing 10% and 2,4% the total of environmental projects, respectively.

These figures and proportions corroborate the insufficient financing level coming from international collaboration and directed to the transfer of clean technologies. With this amount of projects and the very low level of fresh financial resources, is very difficult for a country like ours with a low-level fresh financial resources to practically assume the introduction of more suitable technologies for our environment.

Nevertheless, these small figures are important for the country, since they allow, given the characteristics of our social system, to generate a complementary and multiplier effect on the resources available in the country.

The study has allowed us to define our own limitations as for the access to the necessary resources. We have found, in this sense, that there are internal and external barriers

The external barriers are:

- The economic blockade imposed by UNITED STATES to our country, which limits the access to multiple international sources of finance.
- The criteria of eligibility of the projects, tends to diminish the real contribution of funds to national projects; for example the concepts of incremental costs and co-financing constitutes real barrier that we have already commented.
- The government structure adopted by these mechanisms, similar to those of Bretton Woods that have anything in common with the claims of Agenda 21 Sustainable Development and are based on the defense of the interests of the transnational Banking.

The internal barriers are:

- The lack of experience in the Cuban institutions for the elaboration of this type of international projects. Mainly in the calculations of the so-called incremental costs and their fundamentation.
- The lack of experience for the negotiation this type of projects, including the lack of aggressiveness in its preparation and opportune presentation.

- The difficulties that usually Cuba faces to access to external financial resources, which in occasions cause a certain level self-limitation in the presentation of projects proposals.
- The characteristics and the total amounts of this type of financing requires a level of coordination between the organisms and territories that still needs to be perfected.

Although all of the above constitutes a “stop” to the entrance in the country of new clean technologies, it is not less true than in the routes recognized by Agenda 21, the own domestic resources are established as one the ways to face this challenge. Cuba has not stayed crossed arms in this sense and achieves an intense economic activity for the sake of guaranteeing key elements that in our criteria are:

- To find ways to attract the entrance to the country of this type of technology.
- To find the effective national mechanisms to develop the generation of projects that tend to guarantee the correspondence between economic development and sustainability.
- To develop instruments for economic regulation that facilitate the mobilization of domestic resources directed to the development and implementation of models of more and more clean production.

These experiences are analyzed in the next segment of this work.

III-ACTIONS CARRIED ON BY CUBA FOR THE ATTRACTION AND PROMOTION OF ENVIRONMENTALLY SOUND TECHNOLOGIES.

Despite the above-mentioned external and internal difficulties, the country develops enormous efforts to change the environmental panorama. A whole series of economic measures has been taken propitiate the development of clean technologies.

Some are related with the creation of conditions to attract to the country the clean technologies and others are measures of domestic character that seek to influence in the national producers or foreigners already established in our nation.

It is necessary to say that under the Cuban conditions, clean technologies cannot only be identified with the very advanced technologies. In the case of developing countries, where the inherited technological structures they cannot be suddenly eliminated and the are not sufficiently clean as to guarantee the desired environmental objectives, the development of technological innovation and re-engineering schemes, as well as the application of the national scientific advances, have a wide field development.

The introduction of national variants would allow us, as country, to come closer to production patterns much healthier from the environmental point of view. In this direction are directed a group of the actions developed by the nation in the field the environmental economics.

In relationship, both with foreign and national investments, certain types of bounty been adopted that stimulate the entrance the country and the application of these type of technologies. These actions already found their juridical basement with the approval

the Law No. 81 / 1997 ¹¹ of the Environment, which includes in its Chapter IX “ECONOMIC REGULATION” the provisions necessary to implement the policy traced by the National Environmental Strategy.

In Article 61 of Law No. 81, the use of the economic regulation as a policy and management instrument is established and conceives it based on the use, among others, of tributary policies, tariff or differentiated prices, for actions that impact the environment.

Article 62 establishes the possibility of the use of measures such as:

- a) Reduction or exemption of border tax to the import of technologies and equipment for the control and treatment of effluent pollutants
- b) Reduction or exemption of border tax to the import of raw materials or spare parts for the national production of equipment or instruments needed to avoid, to reduce or to control the contamination and environmental degradation
- c) Authorization, in exceptional cases to the accelerated depreciation of investments carried out in the development, purchase or installation of equipment, technologies or processes that favor the protection of the environment
- d) Exceptional granting of fiscal benefits to certain favorable activities for the environment.¹²

Of these, the bounty is already being applied to the import of technologies, as well as the exceptional authorization to the accelerated depreciation the investments or part of them they dedicated to the solution of environmental problems.

These measures are applied both to national producers and to foreign investors so they might stimulate the changes in the production patterns in the whole productive economic spectrum.

On the other hand also you this implementing a new mechanism mobilizer resources in the internal plane that can be capital importance for the development this type technologies. This is the National Environmental Fund.

Law No. 81 in its Chapter X consecrates the creation of this novel financial mechanism, which presupposes in their application, on one hand, of the design of actions that increase it, and on the other one, positive measures which grants directly to the environment protection¹³. These resources, additional and independent of the Central Budget of the State, will come to supplement the available means to the solution of domestic environmental problems and they won't substitute the responsibility of the productive sector in the solution of the environmental problems that generated by them.

¹¹ Gaceta Oficial de la República de Cuba pág. 56 11 de julio de 1997

¹² Idem

¹³ Gaceta Oficial de la República de Cuba pág. 57 11 de julio de 1997

The introduction of clean technologies in the country and the actions for a healthier environment receives annually an amount of resources from the different agencies and bodies, that allow to solving step by step the more urgent environmental problems.

In this way, we finally want to present the efforts that have been developed by the country in the modification of the production patterns and therefore in the progressive use of less aggressive technologies. These actions are summed up in the Annual Economic Plan, in particular in section related to investments for the environment.

Since 1998, in a process of continuous advance, the Ministries with productive responsibility have assigned resources for this purpose.

Every year the country dedicates a considerable sum of resources to the solution of environmental problems, an important proportion of them devoted to technological changes that allow our productions to be less polluting.

TABLE No 1¹⁴

INVESTMENT PLAN FOR THE ENVIRONMENT.			
	Miles of Pesos		
	1998	1999	2000
TOTAL INVESTMENTS	1,636,343	1,429,422	1,746,587
For THE ENVIRONMENT	104,585	215,460	138,447
PROPORTION (%)	6.3	15.1	7.9

The structure of these investments for environmental sectors suggests that a good part of them are associated to modifications in the technologies of productive processes, included the solutions to the treatment of liquids and solid waste, as well as to the decrease of the atmospheric pollution through the use of diverse technological solutions that are more efficient in the use of energy.

¹⁴ Informe del Plan de Inversiones para Medio Ambiente del año 2000. Pag 7.CITMA/MEP

TABLE No 2
INVESTMENTS FOR THE ENVIRONMENT.
PROPORTIONS BY SECTORS¹⁵

	%
WATER	36.47
ATMOSPHERA	15.46
LAND-SOIL	8.08
FORESTY	20.03
SOLID WASTE	7.00

An important percent of these investments are dedicated to activities that imply modifications in the technological processes, especially those referred to water, where the main part of the resources are dedicated to solve the problem of residual waters, and in the case of atmosphere not only to the decrease of powder emissions, but to the introduction of more efficient equipment in the use of energy as well as the introduction of new gases for refrigeration equipment.

All the previous measures are inserted inside the group of positive measures that tend to stimulate the application of cleaner technologies of national or foreign origin.

Other implemented measures are comand and control ones. Directed to regulate and to propitiate awareness regarding the necessity to progressively produce in a less polluting and impacting way .

In this sense, the investment processes are subjected to certain regulations that guarantee the appropriate control of the environmental impacts caused by them, through the environmental impact assessment and the corresponding environmental licenses granting process. They both constitute indispensable and obligatory requirements for the accomplishment of any investment.

The first manifestation of the political conscience regarding the use of measures of economic character to stimulate appropriate environmental attitudes in the producers was in the approval of Law No.73/1994 of " The Tributary System",¹⁶ that introduces a tax on the use or exploitation of natural resources and for the protection of the environment."

Variants are being studied that will allow the economic influence in activities that generate waste, compelling them to adopt cleaner technologies. In this sense we need to increase our experience in order to guarantee that their application will be effective.

¹⁵ Informe del Plan de Inversiones para Medio Ambiente del año 2000.
Pag 7.CITMA/MEP

¹⁶ Gaceta Oficial de la República de Cuba No.8 del 5 de Agosto de 1994

In the same way, Law No.77/1995. Of Foreign Investment¹⁷,, when defining its objective and contents, establishes that the promotion and incentive to the foreign investment are made on the base "...of the protection and rational use natural resources" (Article 1.1).

Article 39 of this the Law contains a possible overcharge to the tax on profits, when pointing out that when the exploitation affects natural resources, renewable or no, the tax type can be risen in a 50% . (the normal tax type is 30%) through a decision of the Executive Committee the Council of Ministers

Both legal bodies anteceded the ratification of the use of economic incentives for the environment, which were established by the already mentioned Law 81 of the Environment. The approval of them didn't solve the immediate application of these type of mechanisms. Their final design and implementation are going through a process of general valuation that allows, knowing the environmental necessities, to establish the link between them and the economic processes.

At this time we are involved in a perfecting process and implementing these measures, as well as creating the required conditions for its evaluation. This is why we cannot give quantitative elements about their effectiveness.

However there are some examples that we want to highlight in the present analysis and because of their novelty the information was not included in the analyzed data base.

The first one is associated with the reduction level of the polluting loads in the hydrographic basins, which are prioritized in the country. As a result of the work made by the National Group of Hydrographic Basins it is known that a descent of 9.2 % of the polluting load has been achieved in this basins¹⁸.

These reductions are related to the investments efforts developed in 1999 and in many cases they have been achieved with the application of national technical innovations and with the effort that this implies under the economic conditions faced by the country.

The actions for the application of soil irrigation with the processed liquid wastes of sugar industry have been one the applied processes, achieving a double effect of reduction of water pollution and a reduction in the use of chemical fertilizers. This is one the examples of the use of our national technical and scientific potentials in this respect.

The second example, is about procedures that combine the national actions- as for allocation of resources, and the application of foreign novel technologies.

Recently it was approved the execution of a novel project that will allow the national production of 30000 domestic refrigerators per year, free of substances that deplete the ozone layer and with a high energy efficiency¹⁹. This project will be executed by a company of our steel and machinery industry with a contribution from Cuba of 7 MMUSD and with funds of 750 MUSD from GEF and UNDP..

¹⁷ Gaceta Oficial de la República de Cuba No.3 del 6 de Septiembre de 1995

¹⁸ Granma del 19 de Mayo del 2000 pag.3.

¹⁹ Granma mayo 18 del 2000.

Even when this type of collaboration supplements the national efforts, it may be noticed the real disproportion between national contribution and the financing for the introduction of clean productions. Only in countries with a clear political will toward sustainability actions of this type can be achieved.

The discussed aspects have allowed us to arrive to some final considerations and to make some recommendations .

FINAL CONSIDERATIONS

From the analysis made in this paper, some recommendations can be to be considered for the future development of the aspects related with the transfer of clean technologies.

The absence of statistical information on the behavior of investments aimed at the introduction of clean technologies. It was reaffirmed that establishing strategies and policies to get clean technologies demand an information base that provides the behavior of the entry to the country or setting in motion own clean technologies.

The evaluation of the international financing sources shows the low level of access the country has. For Cuba, the contribution received through international collaboration is a valuable factor of complementation in the national efforts for the introduction of clean technologies, specially in the spheres of capacity creation and institutional strengthening, which in our specific case has a multiplying effect due to the internal potentialities the country has, in correspondence with the national policies in those fields.

However, access to these sources of collaboration is limited, due to the complex and diverse demands of these mechanisms, as well as to the lack of expertise in preparing and presenting these types of projects on the part of the national institutions.

The total amount of resources received through collaboration is insufficient to approach with success a radical change in the access and implementation of the clean technologies. This ratifies that foreign investments are another complementing element in the national efforts to introduce cleaner technologies. That is the reason the country has designed mechanisms to encourage these investments.

In the international arena we want to point out that:

The insufficiencies in the informational base detected in our case, and the absence of statistics on clean productions and their transfer in the international level, makes this a common problem to most developing countries, and in which international institutions like UNCTAD and UNEP and other international institutions could help solve.

Difficulties in preparing and presenting projects to the financing institutions is another element that should be common to different developing countries and in that sense international collaboration is also necessary to allow to increase expertise in our countries.

RECOMENDATIONS

Establish a statistical and informative control system in order to quantify the behavior of the development of clean technologies in the national context as well as those that are introduced.

Intensify the process of national capacity building in the process of elaboration of projects to be funded by international institutions.

Ask international institutions the design of methodologies that facilitate the country control of clean technologies.

Request the international institutions to consider the inclusion in the statistical basis of international trade of specific information that can help to know the tendencies of clean technology transfer.

Request the international institutions to support the organization and development of assistance programs aimed to increase capacities in the elaboration of projects for these purposes.