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PROJET ON DEFINITION AND ADOPTION OF STANDARD SPECIFICATIONS FOR INDUSTRIAL PRODUCTS IN CEPGL COUNTRIES

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ABBREVIATION AND ACRONYMS

ARSO	:	<i>African Regional Organization for Standardization</i>
BSI	:	<i>British Standard Institute</i>
CEPGL	:	<i>Communaute' Economique des Pays des Grands Lacs</i>
DTS	:	<i>Droit de Tirage Special</i>
ECA	:	<i>Economic Commission for Africa</i>
FAO	:	<i>Food and Agricultural Organization</i>
FRW	:	<i>Franc Rwandais</i>
GDP	:	<i>Gross Domestic Product</i>
ISB	:	<i>Integrated Standardization Bureau</i>
ISO	:	<i>International Standardization Organization</i>
KBS	:	<i>Kenya Bureau of Standard</i>
NSB	:	<i>National Standards Body</i>
SB	:	<i>Standards Body</i>
TMS	:	<i>Testing and Metrology System</i>
OAU	:	<i>Organization of African Unity</i>
UNDP	:	<i>United Nation for Development Programme</i>
UNECA	:	<i>United Nation Economic Commission for Africa</i>
WHO	:	<i>World Health organization</i>

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FOREWORD

The primary function of the project is to assess the existing and the prospective industrial capacity, reviewing policy, programme, and legislation pertaining to the domain of standardization and identification of regional and international standard organizations. This assignment was given by UNECA and Gisenyi MULPOC for CEPGL States.

The CEPGL member countries are Burundi, Rwanda, Zaire located in the eastern part of Africa and their economy depends mainly on the export of agricultural and mining products. Despite the export of large volume of raw materials these countries have trade unbalances, as imports exceeds exports due to several factors. Therefore, to control and alleviate the economy of these countries it would be essential to establish standards, that must be fully supported by legislation for its implementation, in specific areas of import and export products.

To establish a workable standard, policies on the domain of standardization, the available natural resources have been assessed, the main import and export products and the potential resources to improve the economy has been identified. Based on the available information, assessment and identification were carried out. Finally the methodology on establishing, financing and harmonization of standards to regional and international ones, has been recommended.

The team of the mission wishes to record its appreciation and thanks to all the staffs of ARSO and specially Dr. G.Y.Ahlijah, Secretary-General and Mr. W.N. Okoko, Technical officer, for their readiness in providing the mission with the necessary assistance during its stay in Nairobi (Kenya). The team also extends thanks to all the staff of Kenya Bureau of Standards (KBS) for their cooperation.

INTRODUCTION

1. The need of Standardization and the reason behind it in all aspects is to maintain quality and allow an acceptable exchange between users and suppliers of a product. An acceptable exchange is based on the parameters such as price, durability, availability, reliability, etc. Therefore, any country acting as supplier or buyer of resources or products requires to develop or adopt an acceptable Standard that ensures the Quality of supplies. This measure is indeed essential not only for the sake of having own standards and important role in controlling the economy of a country. The result of which can be seen from the stability and growing economy in the developed and developing countries. In contrast, developing countries remain unstable and decline economically, due to lack of quality assurance on their products they export and the absence of compatible standard with others together with the necessary quality control on products imported.
2. The absence or incompleteness of standards in the underdeveloped countries, conscientiousness level of the public and most of all the lack of readiness in the state apparatus in the enforcement of their standards. As a result these countries import consumer and capital goods from all corners of the world without giving due attention to the quality and uniformity of the products, with the end effect of slow or backward development. Therefore, it is essential to have uniformity, both for imported and exported products to use the possible advantages, for example, the industry sector: cost reduction on spare parts, development of maintenance, modification capability, production the necessary parts and finally assembling of equipment locally. In the other sectors similar advantages can be sited.
3. To prevent adverse effects of exchange between countries and to achieve any level of development, adherence to standards supported with quality control is important. This holds true also for the CEPGL countries, with unutilized potential resources to be exchanged. Therefore, the objective of this study is to assess the existing and prospective industrial production potential of these countries and propose the

necessary measures that should be undertaken to alleviate and harmonize the community standard to higher level.

4. This document is divided into four chapters. The first chapter reviews the profiles of resources and industrial potential and capability of the CEPGL countries. The second chapter assesses the existing and prospective of industrial capacity in the CEPGL countries. The third chapter is devoted to the review of policies, programmes related to standardization. Finally, the fourth chapter presents a brief conclusion on those countries, recommends the establishment of the integrated standardization mechanisms, the testing and metrology system at national and sub-regional levels, and proposes the industrial products to be standardized, the standard to be used, the practice of metrology and quality assurance to be applied on the product.

I PROFILE OF CEPGL COUNTRIES

5. The profiles on geophysical resources, agricultural and industrial potential and capabilities of the CEPGL countries are the basis from which the present and the perspective economic status and exchange strength of these countries can be derived. Therefore, to serve as background information, summary of natural and human resources, import needs and export potential of each country are given in the subsequent paragraphs.

1.1 Burundi

6. Burundi is a landlocked country with total area of 28,490 sq. km. The population is estimated to be six million with an average growth rate of 3.5 percent per annum and a density of 210 inhabitants per sq. km. The geographical distribution shows us about 90 percent of the population are located in the rural area. 52 percent of the land is used for the purpose of agriculture engaging 93 percent of the work force.
7. The Economy of Burundi depends mainly on agriculture accounting about 85 percent for the GDP, while the industrial sector and other services contribute only 5 percent and 10 percent respectively. The annual growth rate of the GDP is estimated to be 4.0 percent.
8. The agricultural resources are Bananas, sweet potato, cassava, pulses, sorghum, corn, yams, taros, peanuts, millet, coffee, tea, rice, wheat, sugar cane, palm products, cotton out of which the main exports are coffee, tea and cotton which shares 50 percent of the country's total earnings. On the other hand to cover the local needs the country imports consumable goods like salt, powder milk, rice etc. Summary of export and import amount (in FBR¹) for the period 1988-92 are given in table 1-1 & 1-2 respectively and to show the trade unbalance a comparison is shown grafically in figure 1-1.

¹Franc Burundais

9. The available natural resources of the country are nickel, uranium, peat, cobalt, copper, platinum, kaoline, lime, gold, vanadium, tin and fish.
10. The main energy resource is hydro power with a production capacity of 56 million KWH (1988), which covers only 40 per cent of the demand. The remaining power is therefore imported from Zaire and etc..

Table 1-1 Burundi's Import in main Product Categories

Imported items (CIF value in FBR ²)					
Description	1988	1989	1990	1991	1992
Manufactured goods	10715.8	10885	15394.5	17607.4	16946.8
Equipment	9798.7	10375.1	13734.2	16479	16204.1
Consumable Goods	8370	8649.6	11050.6	12067.8	12954.8
Total	28885	29910	40179	46154	46105

Sources: Banque de la Republique du Burundi. Rapport Annuel 1992

Table 1-2 Burundi's Export in main Product Categories

Exported Items (value in million FBR)					
Description	1988	1989	1990	1991	1992
Primary Products	17569	11642	12073	16043	1312
Manufactured Products	1021	662	711	654	2234
Total	18589	12304	12784	16697	15354

Sources: Banque de la Republique du Burundi. Rapport Annuel 1992

²Franc de Burundais

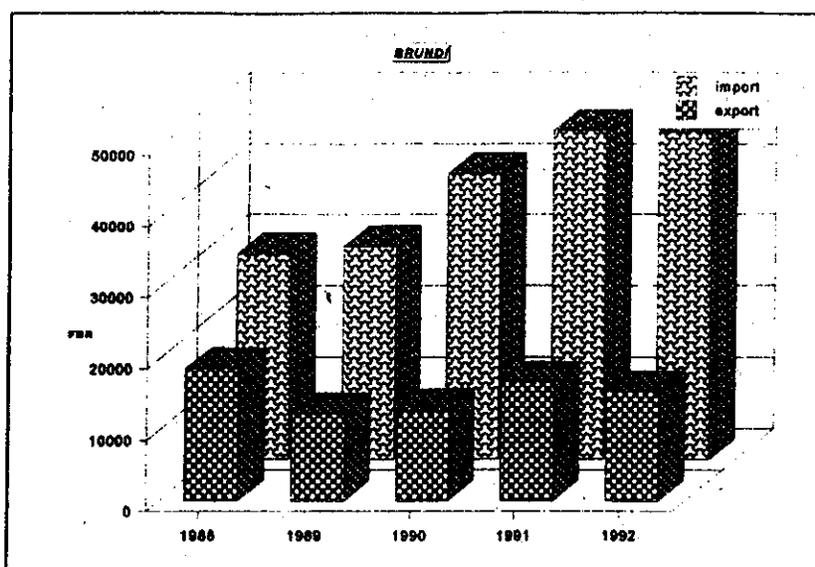


Figure 1-1 Import-Export balance of Burundi

1.2 Rwanda

11. Rwanda is a landlocked country with total area of 26,383 sq. km. The population is estimated to be 6 million with an average growth rate of 4.1 per cent per annum and a density of 275 inhabitants per sq. km. The geographical distribution shows about 92 percent of the population are residing in the rural areas. 46.7 percent of the land is used for agricultural purpose engaging 91.8 percent of the work force.
12. The Economy of Rwanda depends mainly on agriculture accounting about 46 percent for the GDP, while the industrial sector and other services contribute 22 percent and 32percent respectively.
13. The agricultural resources are Bananas, Potatoes, Sweet Potatoes, Cassava, Plantains, Sorghum, Corn, Tobacco, Pork, Coffee, Tea, Pyrethrum, Cinchona, Goats, Cattle, Sheep, Roundwood. Because of lack of organized cultivation, coupled with a high population density, Rwanda has been forced to seek food donations with increasing regularity. However, a programme of agricultural

diversification is now underway, involving some farmers, trying to make this densely-populated nation self-sustaining in food stuffs. The main exports are Coffee, Tea and Pyrethrum, Bananas and Cassava. The export of coffee has been the major source of foreign exchange, which shares 55 percent and Tea 17 percent of the country's total earnings.

14. The available natural resources of the country are Cassiterite, Wolframite, Gold, Natural Gas, Hydroelectric Power, Tin and Fish. Although there was exploitation of mineral resources, principally tin ore, this collapsed in 1986 along with the world market in that metal.
15. The Country has important hydroelectric potential, with several plants and some natural gas reserves. The main energy resource is hydropower, with a production capacity of 172 million KWH (1988), which covers about 91 percent of the present demand. The remaining power is therefore, imported from neighbouring countries.

Table 1-3 Rwanda's Import in main Product Categories

Description	Weight in Tonne & Value in a million RWF			
	1989		1990	
	Weight	Value	Weight	Value
Consumable Goods	67409	7611	67409	6543
Construction equipment & Material	17405	8329	15061	8000
Energy's & Lubricant	95121	3850	88594	3689
Industrial Equipment for production	55594	6910	57565	4826
Total	245217	26700	235287	23058

Sources: *Banque Nationale du Rwanda. Bulletin No. 18 Octobre 1992*

Table 1-4 Rwanda's Export in main Product Categories

Product Group Description	Exported Product Weight in Tonne & Value in Million Rwandise Franc			
	1990		1991	
	Weight	Value	Weight	Value
Animal Product	723	216	833	223
Vegetable Product	59142	7419	52296	10401
Mineral product	1282	505	1400	815
Elementary industry Product	243	13	116	8
Others Industry Products	887	138	1834	99
Reexportation	252	9	419	69
Others	3	1	79	1
Total	62600	8301	56977	11616

Sources: Banque Nationale du Rwanda. Bulletin No. 18 Octobre 1992

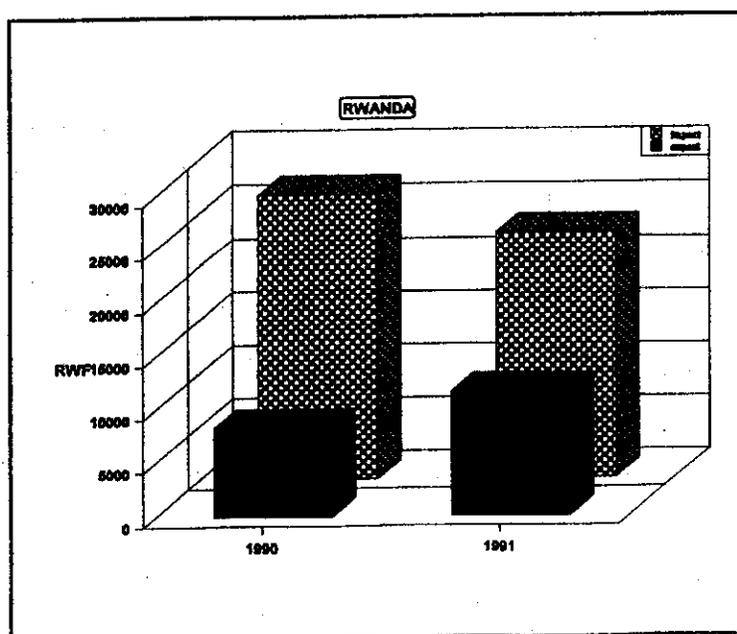


Figure 1-2 Import-Export balances of Rwanda

1.3 Zaire

16. Zaire is located in central Africa with total area of 2,345,000 sq. km and having a sea outlet to out side World. The population is estimated to be 50 million in 1994 with an average growth rate of 3 percent per annum and a density of 15 inhabitants per sq. km. The geographical distribution shows about 60 percent of the population are residing in the rural areas. 3,5 percent of the land is used for agricultural purpose engaging 67,4 percent of the work force.
17. The Economy of Zaire depends mainly on mining which accounts 20 percent of agriculture about 12 percent for the GDP, while the industrial sector and other services contribute 3 percent and 53 percent respectively.
18. The agricultural resources are Bananas, Potatoes, Sweet Potatoes, Sugar cane, Peanuts, Rice, Yams, papayas, Pineapples, Mangoes, Oranges, Pulses, Dry Beans, Cotton, Palm products, Tomatoes, Rubber, Quinine, Chickens, Cassava, Plantains, Corn, Pork, Coffee, Pyrethrum, Goats, Cattle, Sheep and Roundwood. The main exports of Zaire are Coffee, Palms, Rubber, Maniac and Bananas. The export of coffee has been the second major source of foreign exchange, representing 14 percent of the country's total earnings.
19. The available natural resources of the country are Cassiterite, Wolframite, Gold, Tin, Cobalt, Copper, Cadmium, Petroleum, Diamonds, Silver, Zinc, Manganese, Germanium, Uranium, Radium, Bauxite, Iron ore, Coal, Lime, and Fish. The main export of Zaire depends on Mineral resources like Copper that contributes about 47 percent, Zinc 11 percent and Diamonds 6 percent of the total earning. Summary of import and export products for the period (1986-91) is given in table 1-6 and the trade balance in figure 1-3.
20. The main energy resources are Crude oil, Natural gas, Coal and Hydro-power with the potential shown in table 1-5. Despite these resources, the country imports energy from others that consumes about 16 percent of its export earning.

Besides, there are few industries in the area of mining, mineral processing and light manufacturing plants.

Table 1-5 Energy Resource of Zaire

Type of Energy	Unit	Reserve	Production	Consumption
Petroleum	Barrels	96 million	10 million	3 million
Natural Gas	Cubic metres	1 billion	-	-
Electricity (1988)	KWH		5,392 million	5,283 million
Coal	Metric ton	600 million	123000	164000

sources: OAU Profile 1990

Table 1-6 Zaire's Export in main Product Categories

Export Items in millions DTS or Z						
Product group	1986	1987	1988	1989	1990	1991
Mineral Product	948	965	1280	1445	1200	888
Agriculture Product	327	144	176	127	176	120
Industrial Product	114	153	120	130	179	104
Total exported	1389	1262	1576	1702	1555	1112

Sources: Banque du Zaïre. Rapport Annuel 1992

Table 1-7 Zaire's Import in main Product Categories

Import Items in millions DTS ³ or Z						
Product group	1986	1987	1988	1989	1990	1991
Consumable Goods	253	192	150	150	252	200

³DTS = Droit de Tirage Special

Energie	143	119	80	96	116	111
Primary Product	170	137	224	176	171	175
Equipment	175	137	113	135	55	52
Others	300	383	431	667	519	501
Total Imported	1041	968	998	1224	1113	1039

Sources: Banque du Zaïre. Rapport Annuel 1992

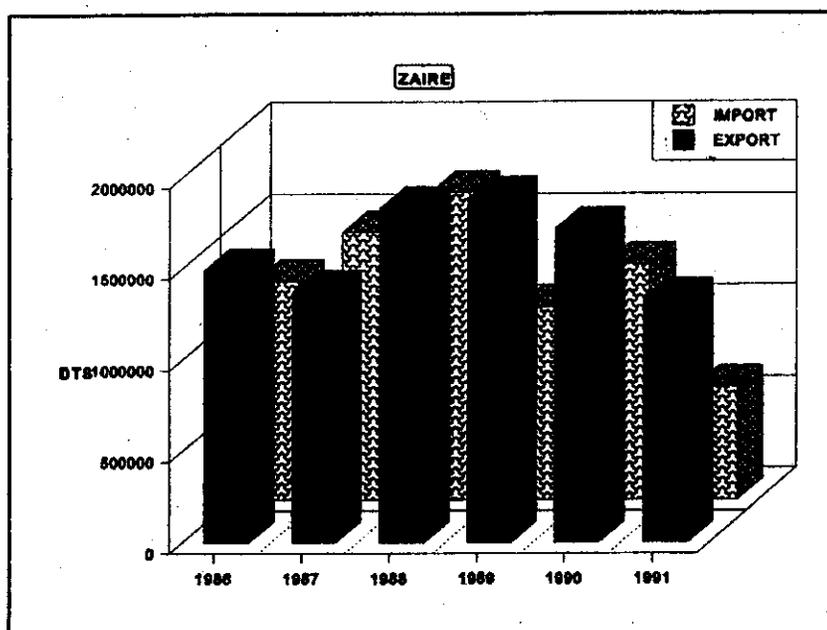


Figure 1-3 Import-Export balance of Zaïre

The Figure 1-1 to 1-3 shows a comparative picture of the total exported products mainly, mineral, agricultural and industrial products and the imported industrial products for the CEPGL countries.

Table 1-8 Summary of the Import-Export value

		1986	1987	1988	1989	1990	1991	avg. % Imp/Exp ¹
BURUNDI Million FBR	Total Imported	--	28885	29910	40179	46154	46105	252
	Total Exported	-	18589	12304	12784	16697	15354	
RWANDA Million FRW	Total Imported	-	-	-	-	26700	23058	250
	Total Exported	-	-	-	-	8301	11616	
ZAIRE Million DTS	Total Imported	1041	998	1224	1113	1039	-	77
	Total Exported	1389	1262	1702	1555	1112	-	

21. Table 1-8 is a summary compiled from tables (1-1, 1-2, 1-3, 1-4, 1-6, 1-7) for the period (1986-1991), to show the relation between the total import and export items in value. From the last column, it is visible that, Burundi imports on the average 252 percent, Rwanda 250 percent (on the basis of two years data) of their export earning. On the otherhand, Zaire has an import to export ratio of 77 percent , which is less than the others. This is due to a better natural resouces export. (Note: the above comparison is done, on the basis of the total average value and without taking into account other expenses, like service, health, etc.)

22. Therefore, this result indicates that, there is a good market potential for industrial products within the community. On the otherhand, there is a lot of unexploited human and natural resourses available. By utilizing the existing potential, most of the imported products can be manufactured locally, provided the products meets the standards in quality required and demand at a reasonable prices, thereby reducing the volume of the imported items. Finally, synchronizing the need with the potential capacity and capability, these countries can achieve optimal economical growth.

¹Imp = Import Exp = Export

II ASSESSMENT OF THE EXISTING AND PROSPECTIVE INDUSTRIAL CAPACITY

23. The CEPGL member countries, because of their geographical location, produce similar agricultural products, mainly cash crops (coffee, tea, cotton etc.), vegetables, fruits and others. Mineral resources available are also similar with the exception of Zaire which has crude oil, coal, diamond, etc.
24. The gross domestic products (GDP) of these countries depend mainly on the export of agricultural products and minerals in their raw or semi-processed form. That means, the performance of the national economy depends on the annual foreign exchange earnings from these commodities. As the prices and the volume of exports are dictated by the buyers, these countries have no control on their economies. Therefore, any drop in prices will have a negative impact on the total performance of their national economies. To combat the uncertainties evolved and to discover their market share, it is therefore, for these countries to expand the existing industrial capacities as well as producing competitive commodities at reasonable prices.

2.1 Existing Industrial Capacity of CEPGL Member Countries

25. Industrialization is believed to be an essential element for the economic growth of developing countries. For this reason development programmes should be given great emphasis on the development of capital goods, industries especially agricultural tools, mining equipment, mineral extraction plant, machinery and transport equipment that are directly in support of the agriculture sector.
26. From the data available in the industrial sector of the CEPGL member countries, the indications are that initiation and sustenance of industrialization is positive. For example, Zaire and Rwanda have great energy potential like hydropower, natural gas, crude oil and etc., which if exploited could meet the demand of the community.

27. Industrial production of medium and small scale activities are currently going on in Burundi and Rwanda which produce items like agricultural tools, simple food processing machines, etc., using imported raw materials. On the otherhand, Zaire has relatively higher scale of production and machine shop facilities.

2.1.1 BURUNDI:

28. Burundi is densely populated with land use of 52 percent for agricultural purposes. Beside this the country is rich in mineral resources which is not yet exploited.
29. The Industry sector covers the assembly of imported components and light consumer goods such as processing of beverage and milk products, textile and leather products.
30. In 1993 the manufacturing industry as a whole suffered 16.8 percent decline, because of a sharp drop of production by the agricultural industries.

2.1.2 RWANDA:

31. The industry sector in the country mainly deals with mineral processing and light manufacturing.
32. Decreased production was particularly remarkable in the processing of coffee and tea, and traditional beverages. And this is solely due to the expansion of the modern beverages (1990-1991).
33. The situation in 1992 varied significantly from one group of product to another. The food, clothing and cement industries achieved very high rates of expansion; on the otherhand, the metal work sub-sector showed a decline by more than 50 percent.

34. The country possesses a large reserve of natural gas which is underutilized. Despite of this, Rwanda is not self-sufficient in energy; import of Electricity increased from 40 percent to 70 percent since 1994.
35. Alternate energy like solar energy (for health centre, pumping water and lightening) and wind energy (for radio transmission), are used in the rural area and covers 0.05 percent of the total energy consumption.
36. The mining sub-sector showed a growth rate of 6.9 percent in 1990, regressed by 11.6-11.3 percent in 1991-1992 respectively. Rwanda is a densely populated with land use of 46.7 percent for agriculture before the April 1994 war.

2.1.3 ZAIRE:

37. Types of industry are mainly mining, mineral processing and light manufacturing.
38. Of the three countries, Zaïre has important mining activities involving the extraction and exportation of Copper, Diamonds, Zinc, Cobalt, Coal and Tin.
39. The mining industry that represents about 15 percent of the national value added in 1984 declined to 6.5 percent in 1991.
40. Imports of expendable consumer products like food stuffs, beverages, tobacco and textiles represented 17 percent and 14 percent of external payments in 1990 and 1991.
41. The country has a large reserve of natural gas which is unutilized while crude oil, and coal are underutilized.

42. Despite a drop in electricity production in the last years, it still exceeds the existing consumption and allows for exportation.
43. Zaire has a vast and sparsely populated land of which only 3.5 per cent is used for agriculture.

2.2 Perspective of CEPGL Countries in the Area of Industry

44. Assessing the existing situation, it is essential for the member countries to expand further their manufacturing capacity, particularly on products for which raw materials, energy and a market exist.
45. The three countries external trade structure shows that they import 17-20 percent of consumer goods (foodstuffs, beverages, tobacco, textiles, shoes, detergents, paper, cartons etc.) from non-CEPGL countries. Therefore, it is imperative that the community's industrial policy should focus on the various industries in order to develop the regions agricultural and mineral resources and reduce the import balance. Furthermore, the following perspectives can also be envisaged:
 - (a) The existing industries can be upgraded to produce better products both in quality and quantity;
 - (b) Industrial potential; the industrial sector can be enhanced with the development of the basic industries like:
 - (1) Mining industry;
 - (2) Steel industry and
 - (3) Metal & engineering industries (agricultural equipment, construction equipment and others) through the exploitation of the mineral resources like Iron ore, Coal and others. This mainly serves as a base for the development of technology locally and also the reduction or replacement of imported raw materials and equipment needed.
 - (c) Increase of land use for agriculture and further employing mechanized

- methods to cover the local needs and enhance the export earnings and
- (d) Increase the energy production capacity by harnessing the Hydro-Power potential and usage of coal, natural gas and crude oil to cover the need of the existing, perspective industries and the public. This can further be supplemented through alternate energy sources (Wind, solar and energy from by products of agricultural wastes such as briquette fuel and bio-gas), specially for the rural sector.

III REVIEW OF POLICIES, PROGRAMMES RELATED TO STANDARDIZATION

46. Throughout the world the process of formulating standards has been standardized. Standards are formulated and prepared with the cooperation of all interested groups, namely manufacturers, consumers and the state to ensure its implementation. In the final analysis, acceptable standards plays an important role to guarantee, manufacturing products with reasonable profit margin for the manufacturers, a fair price and good quality for the consumers and stable economy for the country.
47. In addition, standardization together with the necessary infrastructure is a powerful technical and organizational tool, which can be used by the industrial-, agricultural- and the business-sector, to achieve a rapid economic development at minimum cost. But it should be recognized that, the development of a national standard is not an end by itself, to achieve economic development in a country.
48. In the CEPGL countries, the activity concerning standards is rather low. The offices (Bureau) of standards in Burundi, Rwanda and Zaire are working under the ministry of industry. Their main duties are to protect patents of different firms and industrial designs. They employ FAO/WHO standards for food elements and company standards for other products.
49. The CEPGL countries have no viable Metrology programmes. Yet the development of comprehensive and efficient metrology system is an essential prerequisite for successful industrial and economical development. Metrology provides the basis for traceable measurement, which reflects the orderly development of trade, commerce, industry, science and technology.
50. Therefore, it is essential to develop and to strengthen the CEPGL countries' National Standards Bodies (NSB) to exploit the advantages of standardization, testing metrology system in public service and development of industry that contributes to

the national economy.

The following points must be clearly defined and understood:

3.1 Advantages of National Standards Body (NSB)

51. Although the advantage of establishing and application of standards is briefly introduced, this is further developed and summarized as follows:

- (a) Well-prepared standards represent optimum economic solution to repetitive problems in the design, manufacture, packaging, transportation and delivery of goods.
- (b) Standards protect health, safety, property and the environment against hazards due to the production and use of the disposal of products. They provide rules for the prevention and fighting of fire and explosion and for controlling chemical, radiation, and other hazards.
- (c) The application of standards can ensure interchangeability, operability and compatibility of products and services within and between industries.
- (d) Standards can reduce variety to its optimum level, in design, production, handling, storing, ordering and use of goods and services.
- (e) Standards can provide a solid basis for the assessment of quality of products and services. Their application simplifies the contracting and ordering of goods and services and the assessment of their quality and reduces disputes over specification and quality.
- (f) Standards on quality management and assurance provide a universal guide on how best to establish and assess quality management systems. Their widespread application enables suppliers to improve the quality of products and services, and buyers to have confidence in their ability to supply goods for consistent quality.
- (g) Standards ease communication in most fields of human activity.

3.2 Duties of NSB

52. To promote and apply standardization, quality control, certification, marking and metrology the main duties of NSB should be known and are as follows:
- (a) Prepare, revise or change compulsory standards related to goods, practices and processes in the economic sector and follow their achievement;
 - (b) Certify export and import goods that conform to the national Standards;
 - (c) Inspect and certify the conformity of measuring instruments to the national standards;
 - (d) Affix the standard's mark to goods that conform to national standards;
 - (e) Examine and test goods, practice and processes to ensure conformity to national standards, conduct study and research for this purpose; and
 - (f) Serve as a data bank of standards and measures, ensure a continuous flow in the country, an up to date scientific and technological data concerning standardization.

3.3 Justification of NSB

53. To meet the broad objectives of standardization more effectively and to ensure proper use of the resources of the countries and to encompass the activities of standards preparation, certification and metrology, the establishment of a NSB is justified due to the following reason:
- (a) To create a strong standardization infrastructure to support the country's social and economic development leading to an accelerated agricultural, industrial and commercial growth;
 - (b) To protect the health and safety of citizens and to safeguard property against hazards related to locally produced or imported products such as food stuffs, electric and gas, chemicals, and others through standards and tests;
 - (c) To provide standards and to evaluate the impact of products and processes

- on the environment and further, to reliably guide the management of ecologically sustainable development;
- (d) To improve the quality of the local product and to promote the export capabilities of local industry; and
 - (e) To effectively and efficiently use the resources available in the country and to promote standardization in harmony and consistent manner.

3.4 Programme of NSB

54. To use the advantages of following a National or any acceptable Standard, it must be embodied in the national development network as a constituent of development. That is to say, the national economic programmes for industrial, agricultural and commercial growth on one hand and the standardization policies and strategies on the other, must go hand in hand, so that the national standardization efforts being made is carried out and circulated into the main stream of the nations building.
55. Thus, to achieve the greatest contribution from a Standard, it has to be accompanied with standardization policy having the following programmes:
- (a) To promote standard related activities on harmonizing the multiplicity and complexity of technical practices;
 - (b) To promote the use of a consistent and uniform measurement practice nation-wide;
 - (c) To distribute standards information to users throughout the country; and
 - (d) To support the development and maintenance of appropriate quality management systems nationally which results in customer satisfaction.

3.5 Policy of NSB

56. For a satisfactory application of national and international standard it would be essential to have a policy with the programmes enumerated in the previous section and fully supported through legislation. These measures ensure the effectiveness

and worthiness of the investment made towards standardization. To this end, the CEPGL member countries ought to change their respective policies as follows:

- (a) Standardization activities in the country must address practical and utilitarian needs only;
- (b) The national Standardization effort should be geared towards international harmonization of standards;
- (c) Compulsory national standards should be developed in areas where appropriate resources and mechanisms are in place for an effective and efficient use of the standards;
- (d) Due consideration should be given to effectively engage in the development and application of the national socio-economic policy in areas that demand the involvement of certification and testing activities;
- (e) Voluntary usage of the national Standard should be encouraged; and
- (f) An appropriate centre that collects, identifies and distributes both national and international standards and related information should be established.

3.6 Identification of Standard Organization at National and Regional Levels

- 57. In most regions of the world, priority has been given to solve the problems of technical barriers to trade and regional co-operation through the development and application of harmonized standards and technical regulation.
- 58. Most of the time, it may not be necessary to reinvent the wheel, if they are already there. It would be rational for these countries to adopt the existing ones and modify them according to their needs in order to meet regional and international standards.
- 59. The African Regional Organization for Standardization " ARSO " has an important role in the promotion of the industrialization efforts in the region, expansion of intra-African trade and integration of the economies of African countries through the insurance of Regional Standards. In this context ARSO prepares and issues

African Regional Standards (ARS), and further group of Draft African Regional Standards (DARS) are presently being processed for publication, which is suitable for commodities and practices of particular interest to Africa.

Table 3-1 ARSO Standards for Agricultural and Food Products

No.	Type of Industrial Product	ARS	DARS
1	Prepackaged Foods-Lebelling	ARS 56	
2	Food Additives and Processing	ARS 57	
3	White Sugar-Specification	ARS 58	
4	Margarine-Specification	ARS 59	
5	Canned Corned Beef-Specification	ARS 60	
6	Canned Sardine and Sardine-Type products-Specification	ARS 61	
7	Meat and Meat Products	ARS 125 / 126	
8	Edible Soya Bean Oils	ARS 317	
9	Edible Arachis Oil	ARS 318	
10	Edible Maize Oil	ARS 320	
11	Processed Pineapple-Specification	ARS 175	
12	Processed Tomates-Specification	ARS 171	
13	Citrus Marmalada-Specification	ARS 180	
14	Tobacco		DARS 310 - 315
15	Edible Sunflower Seed Oil		DARS 316
16	Code of Practice for Processed Meat Products		DARS 120
17	Sampling Plans for Prepackaged Foods		DARS 124
18	Agricultural Products		DARS 484
19	Code of Practice for Smoked Fish		DARS 122

20	Code of Hygienic Practice for Low Acid and Acidified Low-Acid Canned Foods		DARS 122
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Table 3-2 ARSO Standards for Engineering Products

No.	Industrial Product	ARS	DARS
1	Building Construction-Modular Coordination	ARS 63	
2	Technical Drawing-General Principle of presentation	ARS 65	
3	Building and Civil Engineering General Vocabulary	ARS 127/1	
4	Plywood-Classification	ARS 181	
5	Specification for Lime	ARS 413	
6	Mosaic Parquet Panels	ARS 445	
7	Solid Wood Parquet	ARS 446	
8	Specification for Asbestos	ARS 425	
9	Asbestos-Cement Products	ARS 427	
10	Joints in Building		DARS 263
11	Wood		DARS 333 - 344
12	Technical Drawing		DARS 265 - 268
13	ISO General Purpose Screw	ARS 67	
14	Fasteners	ARS 69	
15	Agricultural Equipment	ARS 553	
16	Steel Wire	ARS 555 / 557	
17	Structural Steel	ARS 558	
18	Picks and Beater Picks	ARS 548	
19	Matches-Specification	ARS 551	
20	Shovels-Specification	ARS 552	

21	Wooden Handels	ARS 549 / 550	
22	Mild Steel		DARS 555
23	Barbed Wire		DARS 556/1
24	Blooms, Billets, and Slabs		DARS 558
25	Portland Cement		DARS 626
26	Freight Containers	ARS 104 - 107	
27	Palets for Material Handling	ARS 108	
28	Packaging-Pictorial Marking for Handling of Goods	ARS 112	
29	Metallic Material		DARS 269, 271/1
30	Rolling Bearing		DARS 508 - 513
31	Zinc Ingot		DARS 536
32	Steel Products		DARS 529
33	Benzole Industry		DARS 287
34	Air and Cargo Pallet Nets		Dars 239, 240
35	Packaging		dars 244
36	Freight Containers		dars 392
37	Generatin, Transimission and distrbution of Electrical Energy		DARS 219 - 222
38	Prumary Batreies		DARS 229 /1 - 2
39	Safety requirement for mains Operated Electronic and related Apparatus		DARS 249
40	Electrical Installation of Buildings		DARS 373/1 - 3
41	Safety of House Hold for Electrical Appliance		DARS 379/1 - 2
42	Electrical Installation of Building		DARS 371/1, 373/2 - 4
43	Low Frequency Cable		DARS 644/1 - 4

Table 3-3 ARSO Standards for Chemistry and Chemical Engineering Products

No.	Industrial Product	ARS	DARS
1	Fertilizer	ARS 72 - 77	
2	Paper, Board, Pulp and related Terms	ARS 78	
3	Laboratory Glass Ware	ARS 139	
4	Soaps	ARS 368, 369, 485	
5	Laundry Soaps	ARS 490	
6	Solid Fertilizer	ARS 499	
7	Fertilizer	ARS 503	
8	Toilet Soap	ARS 489	
9	Petroleum Industry		DARS 216/1-2
10	Pharmaceutical Industry		DARS 217.1-2, 218
11	Paper and Board		DARS 113, 114

Table 3-4 ARSO Standards for Textile Products

No.	Industrial Products	ARS	DARS
1	Textiles	ARS 80 - 90	DARS 230 - 232
2	Clothes Size Designation	ARS 102, 103	DARS 233 - 238
3	Cotten Fibers	ARS 393	
4	Netting Yams		DARS 412
5	Textile Floor Covering		DARS 143 - 145
6	Textile Products		DARS 653 -659

60. The existing ARSO standards, which has already developed all the necessary standards geared towards the specific needs and uses in the region and the ISO, currently implemented by the developed countries (except a few) which are the main consumers of export commodities from CEPGL member countries and suppliers of industrial and consumer goods.

61. In addition, advantages should be taken by exploiting the experiences of countries, in a similar stage of development, socio-economic condition in view of the resources available, particularly of people and technical knowledge, during the formulation and accomplishment of NSB. Consequently, it is advisable to share the experience of KBS (Kenya Bureau of Standards), with experience of 23 years of successful operation.

62. Therefore, the national standard of these countries should observe the harmony with these standards mentioned above. Since these institutions specially ARSO, a member of ISO possesses, the infrastructure and work force that should be exploited in the development of local standards, such as the provision of necessary training, developed experiences and adoption of the established standard.

IV CONCLUSION AND RECOMMENDATION

4.1 Conclusion

63. Therefore, facilities should be developed and expanded to promote the exchange of goods and services between the member countries. This contributes toward the integration of industrial policies and programmes of the community in the development of energy, material resources, light and heavy industries in the community.
64. In the domain of industry, efforts should focus on the production of expendable consumer products, both to reduce foreign dependence and develop agricultural and mineral resources.
65. A strategy should be devised on specialization for the manufacturing industries set up in CEPGL member countries and further use of national and community instruments for economic promotion.
66. For the development and improvement of industries, the available energy resources should be properly and efficiently utilized.
67. The three countries should formulate agricultural policies that will allow the use of land and man power resources in the community for the purpose of realization and consolidation of self-sufficiency in food production. Specific programmes on the improvement of subsistence farming in Rwanda and Burundi and on the expansion of land under use in Zaïre should be launched to curb food shortages.
68. The National Standard Body (NSB) should be regarded as an organization which supports a national policy for quality. The underlying aim is the improvement on quality of products and consequently the competitiveness of companies both in domestic and export market. The NSB which provides these services should be regarded as an essential tool in the industrial and economic development of those countries. However, it requires legal framework to carry out effectively the following

standardization activities:

- (a) Formulation of Standards
- (b) Quality Control
- (c) Implementation of Standards
- (d) Testing of Commodities
- (e) Documentation
- (f) Metrology
- (g) Training
- (h) Certification,

69. So far, none of this activities has been undertaken in the three countries. The task at present should therefore, focus on the planning to establish NSB and to organize for its growth to carry out its tasks.

70. To perform the activities described above, one requires skilled man power, bureau, office accommodation, laboratory etc. Indeed, the financial situation of those countries may not allow to do all activities at a time. However, the activities like formulation of standards, quality control, application of standards, certification, establishment of library and training of personnel in industry can be performed. On the other hand, the activity of testing requires large amount of money for construction of laboratories and purchase of equipment. This duty can be undertaken at the final stage of the NSB.

4.2 Recommendation

4.2.1 Establishment of Integrated Standardization Bureau (ISB) for implementation of standards at national level

71. The role of standardization in economic development for developing countries need an integrated approach, i.e., it is essential from its earliest stage of operation, to be responsible not only for standards writing but also for quality control, certification, metrology and applied research for improvement of quality.

72. A schematic diagram of the integrated approach to standardization is given in the figure 4-1. First of all, attention should also be focused on quality assurance to ensure confidence that a product is fit for its purpose. There are three types of quality assurance: self-provided by the manufacturer, second party assurance provided by the purchaser, and third party-provided by a neutral body like NSB. For certification (third party quality assurance), a documentary standard should have been formulated defining the quality level. Quality Control, which is the operational means of sustaining quality in production, should be applied to control and improve product quality. Measurements are therefore, required for processing and product control; there are standards for sampling and inspection as well as methods of testing. Furthermore, the measuring instrument should be calibrated so that they are traceable to the physical standards which form the basis of metrology, the science of measurement. Finally, applied research may be required to develop and manufacture a product capable of meeting the requirements of the standard.

4.2.2 Implementation of Standard

73. Formulating and issuing standards can have benefits only if it is followed by implementation. Because of this reason the ISO changed the definition of standardization in 1980 to include the implementation aspect which had been rather much neglected.
74. Implementation of standards in industry implies the strict adherence to the following activities:
- (a) Product standards should be respected in purchasing, production and marketing;
 - (b) Standards codes should be followed in construction and maintenance practice;
 - (c) Standard methods of sampling and testing should be practiced for quality assurance; and
 - (d) Design engineers should follow the basic standards as well as codes of practice.

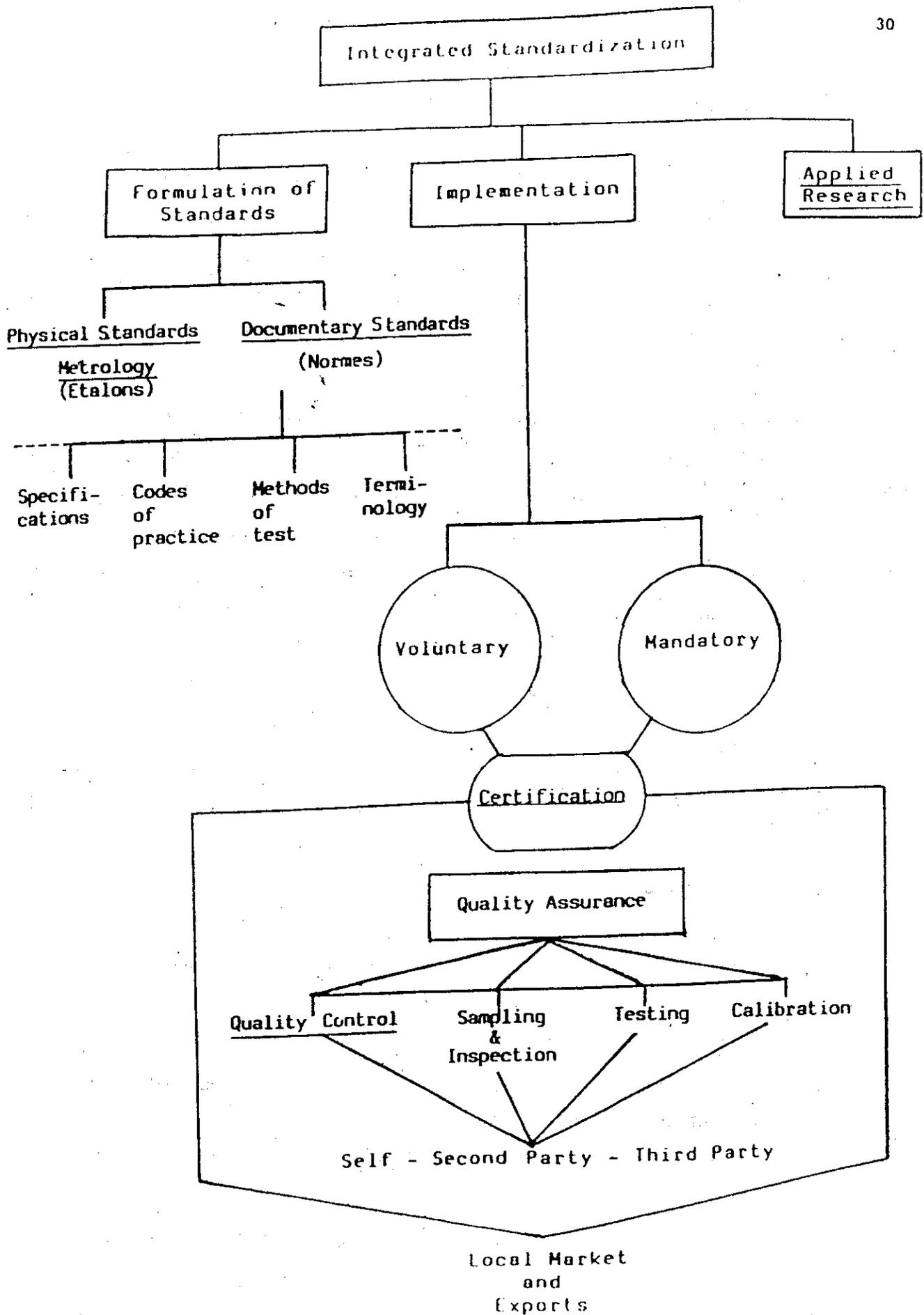


Figure 4-1 Schematic diagram for Integrated approach of Standardization

75. The implementation of standards should be made either on voluntary or mandatory basis depending on the nature and situation of the country. Generally, standards should be compulsory in the area of health and safety and also in the activity that affects the country's economy. For example, food additives or safety of products potential market on industrial products should be mandatory. On the other hand export and import products need compulsory standard, if they are critical to the country's economy and avoid the free flow of sub-standard products.
76. The realization of standardization requires first the identification of the needs of factories, public, private organization and government and then preparation of final standard on the basis of draft worked out by the various technical committees and commented on by the public. Finally, the implementation processes is done through certification, reference in public purchasing and legislation, which is shown in schematic diagram (Figure 4-2).
77. For successful implementation, incentives should be given to factories for joining the certification schema on a voluntary basis. Further, as the government is a major purchaser, should give a lead to public and private sector, purchasing goods which comply to the accepted standard. To avoid the need for the public purchaser, enforcement officers to verify products compliance to the relevant standard, certified products has to be encouraged in the market.

4.2.3 Development of National Standards Body (NSB)

78. A strong national standard system responsible for formulating, issuing and implementing standards has to rely on a well-organized national standards body whose main objectives are based on the integrated following approach to standardization,
- (a) the preparation of standard;
 - (b) the operation of certification marking scheme for compliance with standards;
 - (c) assistance to factories in quality improvement;
 - (d) the provision of testing service

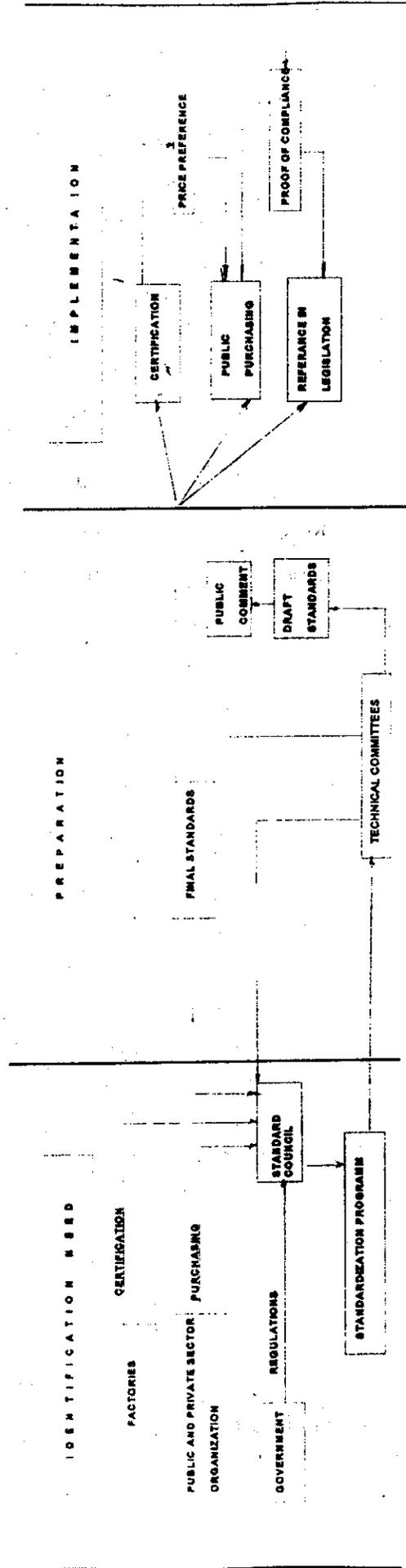


Figure 4-2 Schematic Diagram for illustration the steps followed during Implementation

- (e) the maintenance of primary standards of measurement and their dissemination through calibration services;
- (f) the promotion of standardization and quality control in all sectors of the economy;
- (g) applied research for technical development.

79. To develop the NSB, a number of activities should be undertaken. A graph of the PERT type has been used to present the activities in the development plan. It allows us to visualize the order of the activities, their linkages, the target dates and the consequences of any delay.

The activities in the standard system take place along the following five lines:

- A - Formulation of standards;
- B - Setting-up of laboratories and a laboratory accreditation system;
- C - Establishment of the certification system;
- D - Provision of technical assistance to factories and their preparation for standardization and certification; and
- E - Setting-up a communication strategy to promote standardization and quality assurance.

80. The first three lines A, B, and C converges to point P_1 which materializes conditions appropriate for the certification activity. At point P_2 which is behind point P_1 in time, factories which have been trained are ready for certification. P_3 shows the readiness of manufacturers to supply certified products. The implementation of the development plan given in Figure 4-3 provides an essential tool in the industrial and economical development of the country.

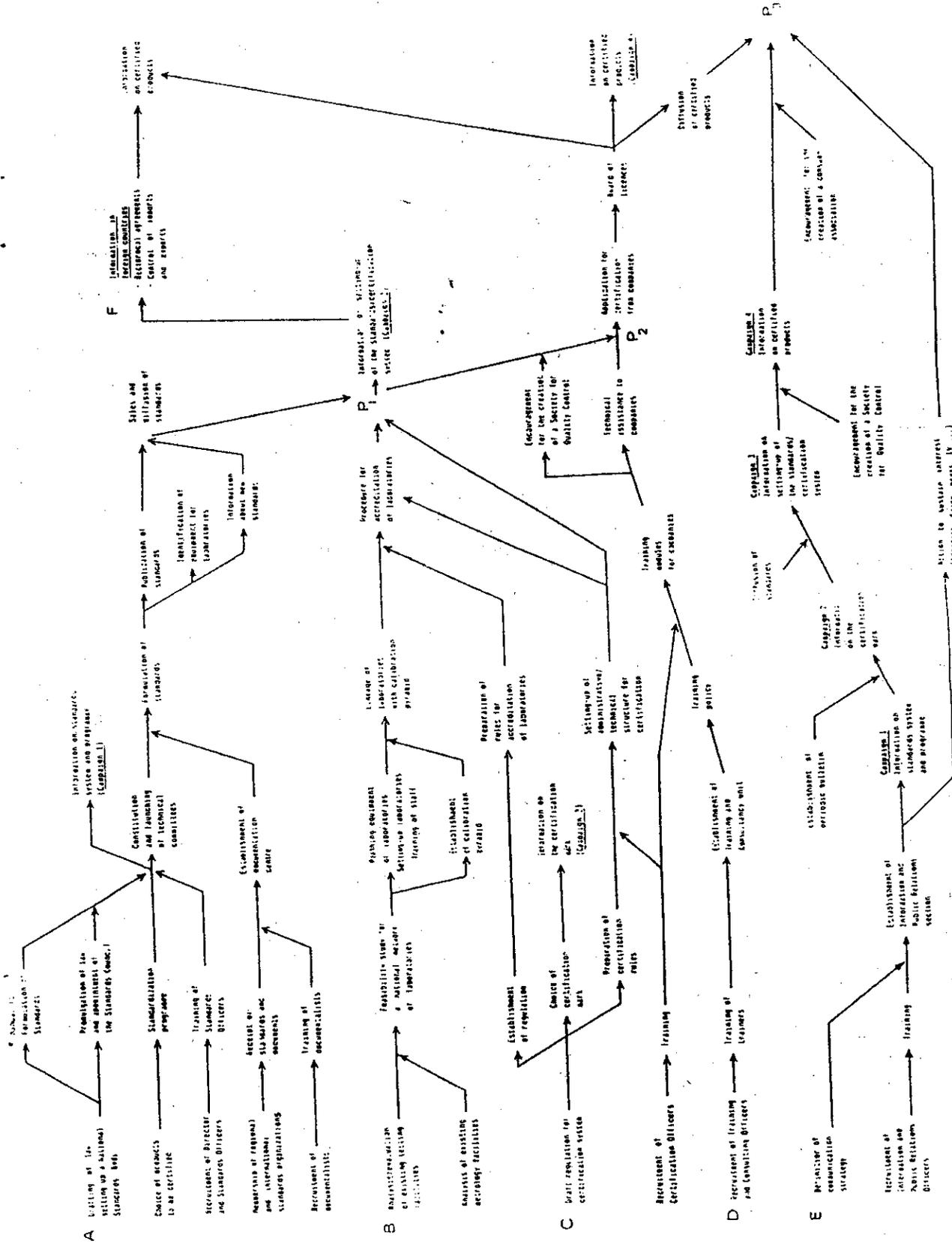


Figure 4-3 Development Plan for National Standards System

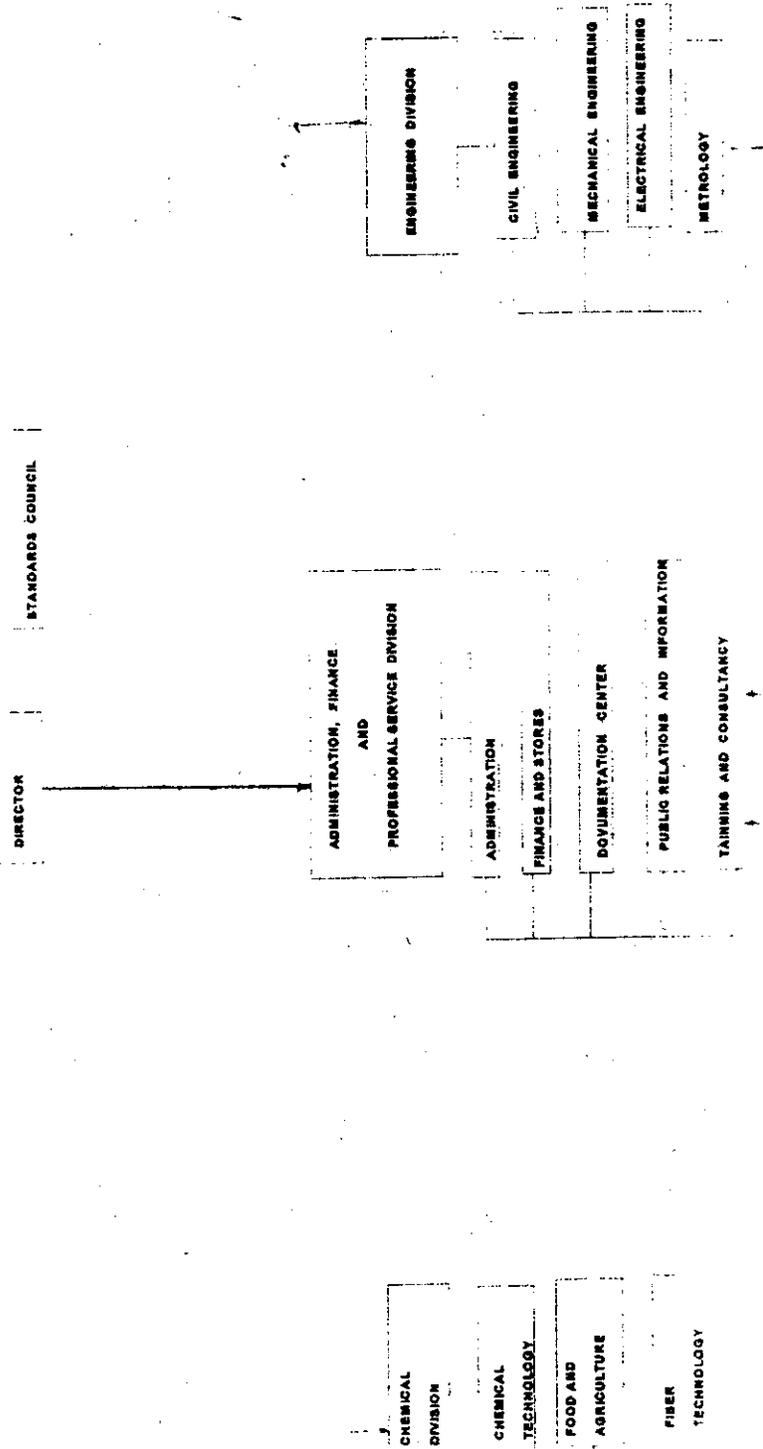


Figure 4-4 Organization Chart of NSB (vertical approach)

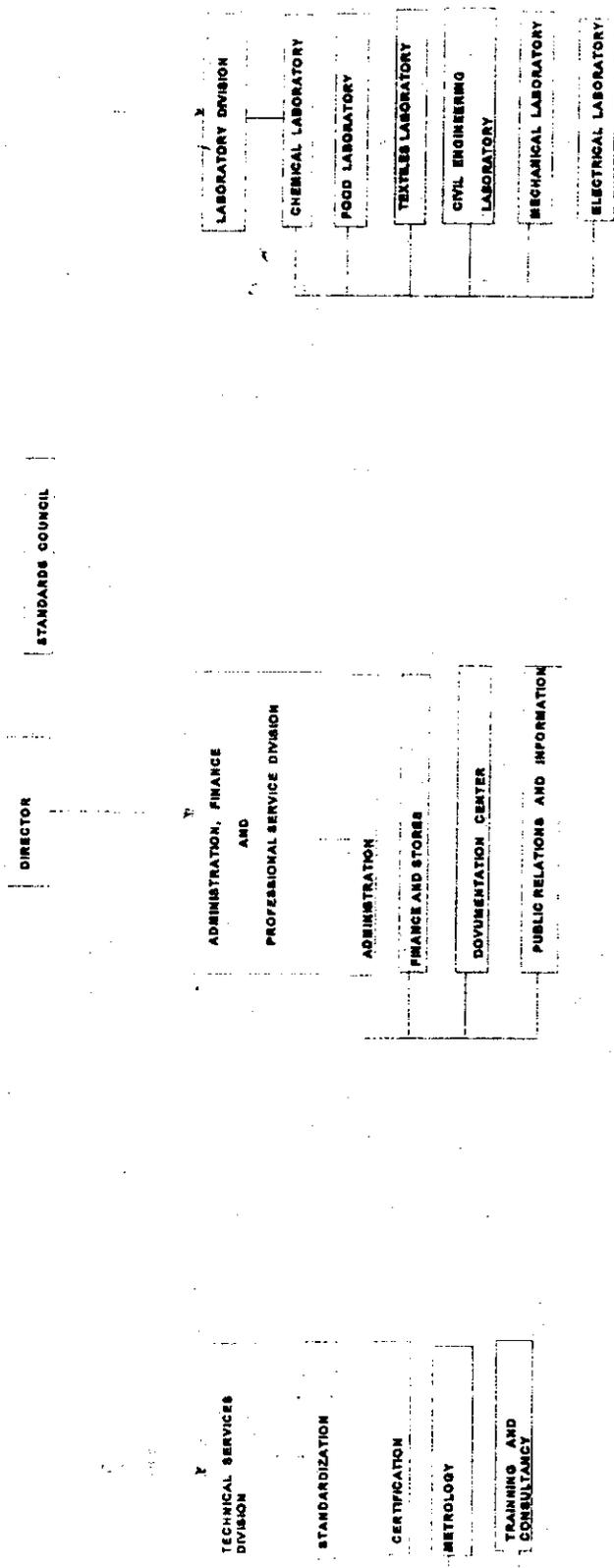


Figure 4-5 Organization chart of NSB (horizontal approach)

4.2.4 Establishment of Testing and Metrology System

81. The NSB needs laboratory facilities for investigations, application of standards and to certify products. It is therefore, essential to evaluate the existing testing and metrology laboratories within the country. Such facilities are not available in CEPGL member countries, Both for those possessing facility and those with none, proper feasibility study for setting up a national network of laboratories, identification of the areas for which laboratories are required and the necessary prior personnel training have be done. It has to be kept in mind, that the identification of equipment for the laboratories should be done by a body having experience in this area (ex. ARSO, KBS etc.) in collaboration with the personnel trained. This will allow the staff on the job training and also build the confidence to carry out further NSB developement.
82. At the beginning, the NSB may relay on outside laboratories which have accreditation by the consumer for testing. This will have a double fold effect,
1. to over come the need of high financial input at the initial stage and
 2. to achieve an acceptance on the activities of the NSB.
83. For the launching of a testing and metrology system, publications of the International Conference on Laboratory Accerodation (ILAC) that provide useful information on how to establish or operate laboratory accreditation should be adhered to.
84. Besides the laboratories, the NSB should possess metrology facilities that serves as a reference to provide calibration services periodically for testing and measuring equipment. This ensures the reliable of test results and to develop confidence on NSB both by the users and purchasers.
85. An organization chart for an NSB based on the horizontal approach is given in Figure 4-4. The metrology section can be responsible for accreditation of outside laboratories. When the work of the NSB expands, the technical services divisions can be split to have four more division dealing with Standardization, Certification, Metrology,

Training and Consultancy.

86. The advantages associated with specialization in the horizontal approach can still be obtained with the vertical approach (Figure 4-5), if there are several Standards Officers in each technical section and each Standards officer is assigned a specific activity in that technical field.

4.2.5 Methodology for Implementation

87. The methodology for implementing standardization in the CEPGL countries should be carried out in three phases. Starting by giving orientation for the people concerned either directly or indirectly through seminars, setting up of the necessary facilities and organizing the necessary manpower and finally implementation

Phase I

88. A workshop is essential for the implementation of standardization within the CEPGL countries. This is to raise the conscientious level, readiness and willingness of responsible people in the governments and other institutions for the purpose of optimizing the available resources within the community and improve the trade exchange between the member countries, with the end effect of reduction in import from non-member countries and allviate the export capability of the community.
89. For the realization of the first phase, the participants in the workshop to be conducted should include all the following parties concerned:
- (a) Technical departments of representative industries;
 - (b) Economic operators from member countries as well as from outside who are involved in industrial production and trade within the community;
 - (c) Traditional and prospective financial supporters; and
 - (d) Representatives of Organizations specialized in the area of standardization.

90. The venue for the workshop should take place at a location where the technology level employed and resource available is relatively better within the community. This will allow the ease of organizing visits to industries, an essential component for the seminar. After assessing the existing situation in the three member countries, Kinshasa (Zaire) would be appropriate centre for this purpose.

Phase II

91. After the accomplishment of phase I, the necessary infrastructure should be laid while training the minimum manpower needed to start with the implementation.
92. Initially, it will be necessary to recruit a professional officers for the areas of standardization enumerated below, who acts as secretaries to the *Industrial Standards and Technical Committee*. Further, to recruit a quality control officer to initiate and lay the foundation for quality control, implementation and certification. In addition a qualified librarian who will be responsible for the documentation.
93. Training of the professional staffs is very essential as formulation of standards or quality control can not be performed without having basic training.
94. The task of basic training abroad can be programmed with the cooperation of ARSO. But the support personnel can be trained locally, inviting experts on the area.
95. The training could be financed through Technical Assistance Funds available for this purpose from donor countries.

i) Industrial Standards Committee Functions

96. It is recommended to establish an Industry Standards Committee for each area of standardization given below. The committee should be composed of persons of managerial level from producers, users, government and research institutions who have first hand knowledge of the industry. The duties of the committee are to

determine subjects for standardization and to allocate and supervise the work of technical committee.

ii) Technical Committee Function

97. A Technical Committee should be established under each Industry Standard Committee to carry out the actual drafting of standards. Member of the technical committees should be experts and represent producers, users, government and research institutions.

iii) Areas of Standardization

98. The areas for standardization should be defined as follows:

- (a) Basic and general standards.
- (b) Food and agriculture.
- (c) Chemical and environmental protection.
- (d) Drugs and pharmaceuticals.
- (e) Textiles and leather.
- (f) Civil engineering.
- (g) Electrical engineering.
- (h) Mechanical engineering.
- (i) Transport and communication.

Phase III

99. Following the accomplishments of the two phases, the implementation part should be carried out. This should follow the steps enumerated in section 6.1.2

4.2.6 Adoption of Standards

100. During the formulation of standards it is not essential to re-invent the wheel. In areas where there exists standards, adoption should be made to minimize cost, time and also gain acceptance on the standards set. The adoption can be made from regional (ARSO, etc.), other national (BSI, DIN etc.) and international (ISO, WHO, FAO etc.) after being either full or correspondent member of the regional or international standard organizations.

101. There are several ways of adopting standards among which, the following methods are recommended.

- (a) An identical standard, identical in every detail with the corresponding standard from which it is to be adopted;
- (b) Technical equivalent standard, all technical aspects the same with modification in wording and presentation; and
- (c) Related but not equivalent standard, covers the subject matter similar to that covered by a corresponding standard but modified according to the countries need or enforcing capability.

4.2.7 Identification of Industrial Product to be Standardized

102. For the purpose of identifying industrial products to be standardized,

- (a) the member countries resources,
- (b) available infrastructure,
- (c) existing industries,
- (d) needs (currently imported products) and prospective capabilities

were assessed and the following criterion were set:

- (a) *Products should protect the health, safety of the community and environment against hazards due to production or importation.*
- (b) *Products should fulfil the community current and prospective needs through exchange within the community and curb or minimize the importation of commodities from non-member countries.*
- (c) *The products that can result in a positive effect on the community national economy.*

Based on these, the following industrial products are identified as feasible products and needs standardization:

Table 4-1 Recommended Standards for Identified Industrial Products

No.	Sector	Products	Proposed Standards	
			ARSO	ISO
I	Food Products	- Sugar - Canned Corned Beef - Margarine - Oil	x x x x	
II	Drugs and Pharmaceutical Products			x
III	Beverage Products	- Soft Drinks - Mineral Water - Beer and etc.		x x x
IV	Chemical Products	- Toilet and loundary Soap - Fertilizers - Plastic Products - Cosmotics and etc.	x x	x x x

V	Petroleum Products	- Benzine - Gas Oil - Fuel Oil - Lubricants and etc.		X X X X
VI	Textile and Leather Products		X	
VII	Building and Construction equipment	- Cement - Reinforcement Bars - Wire - Bricks, etc.	X X X X	X X X
VIII	Engineering Products	- Raw materials • <i>Steel</i> • <i>Plastic</i> • <i>Chemicals</i> • <i>Aluminium</i> • <i>Copper and etc.</i> - Mining Equipment. - Agricultural Equipment. - Machinery - Electronics Equipment. - Transportation - Communication and etc..	X X X X X	X X X X X X X X

103. Therefore, for the above listed industrial products in the various sectors both imported and locally produced, requires standards and certification to protect the economy of the community from unnecessary and redundant expenditure. However, priority should be given to standards dealing with products which have a good chance of being certified, to enable the NSB show tangible results to the authorities and gain support.

4.2.8 Formulation of community standard

104. For the community, preparing a common standard on the products to be exchanged

within is very important. In formulating communal standard first, the major products manufactured in member countries must be identified. Out of these, common products should further be selected, for which technical information and specification should be provided. Finally, harmonized communal standard could be formulated or adopted based on the information provided.

105. Fortunately, the standards that are mostly needed in the region have already been formulated and prepared by ARSO. Thus, to avoid repetitive works and unnecessary expenditure by the community SB, the adoption of the available ARSO standard is recommended [8].

4.2.9 Financial Implication for the Establishment of NSB

106. The establishment of NSB and its realization requires financial resource both in local and foreign currency. At the initial stage, since the body will be service giving, it can not generate income to maintain its functions. Therefore, it relays on a financial support from the government, fund obtained from technical assistance and other donor institutions.
107. Most of the NSB in the developing countries are organized, utilizing the technical assistance available from developed countries (eg. Sweden, Germany, Japan, etc.), for the purpose of personnel training and for the purchase of metrology and laboratory equipments. Similarly, the NSB in the CEPGL countries can benefit from such assistances to cover expences needed at the initial stage. The sum required for its launching is estimated to be 3,000,000 USD, out of which 500,000 USD serves for the training of the technical committee secretary and the rest for the purchase of the minimum needed equipments. The summary breakdown is given in table 4-2. (Note: On the job training of quality assurance personnel will be facilitated by the equipment delivering company)

At a later stage the dependence can be minimized and it's financial requirements can be met from:

- (a) certification and testing of products;
- (b) calibration and verification of measuring instruments;
- (c) certification of quality system of companies;
- (d) subscriptions from its members and
- (e) other services and activities such as training, information and consultancy.
- (f) licensee fee like application, registration, initial assesment, annual renewal and re-assesment fee.

Table 4-2 COST OF TRAINING AND METROLOGY EQUIPMENT

Area of Specialization	Training for the Secretary of the Technical Committee			Metrology [M], or Laboratory[L] Equipment Cost in USD
	Qty.	Cost in USD/Head	Duration in Months	
Basic and General	1	100,000	6	700,000 [M]
Food and Agrculture	1	30,000	3	160,000 [L]
Chemical and Enviroment	1	60,000	6	300,000 [L]
Standard Chemicals				150,000 [L]
Drugs and Pharmaceutical	1	50,000	3	120,000 [L]
Textile and Leather	1	30,000	3-5	100,000 [L]
Civil Engineering	1	50,000	3-6	200,000 [L]
Electrical Engineering	1	60,000	6	250,000 [L]
Mechanical Engineering	1	50,000	3-6	200,000 [L]
Transport and Communication	1	60,000	3-6	200,000 [L]
Total	9	490,000		2380000

ANNEX I**TERMS OF REFERENCE**

Project title: Definition and adoption of standard specification for industrial products in CEPGL member countries

Duration: Two months

Duty station: Nairobi / Kenya 25 days

Duties: The consultant will be attached to the ARSO head quarter in Nairobi / Kenya.

- 1) Contact with the management of the Gisenyu-MULPOC **(2 days)**
- 2) Contact with the CEPGL Executive Secretariat **(3 days)**
- 3) Field data collection mission to CEPGL countries and other interested organization and institutions **(25 days)**
- 4) Analysis of data and compilation of study document **(25 days)**
- 5) Completion of study document **(5 days)**

Qualification: A top level consultant specialized in standardization and the industrial domain, having in addition good knowledge of the industrial climate in CEPGL member countries; good knowledge of trade issue.

Minimum level of education: Master of Science degree in Mechanical Engineering with at least 10 years of relevant experience.

Language: Fluency in English or French with drafting ability.

ANNEX II
SCHEDULE FOR CONSULTANCY

<u>Details</u>	<u>Period</u>
Arrival in Nairobi:	16 August
Brief at ARSO head quarter:	17 August
Visit of KBS:	18 August
Mission to RWANDA:	20-27 August
Brief at ARSO head quarter:	28 August
Factories visit in Kenya/Nairobi:	5-7 September
Finalization of report:	28 Aug - 5 October

ANNEX III**LIST OF ORGANIZATION VISITED****KENYA**

Kenya bureau of standard
 P.O. BOX 54974
 Nairobi-Kenya

Head of standard and development

Mr. G.K.Muttai

Mr. S.KI. Kiaria

Kenya bureau of standard
 P.O.BOX 54974
 Nairobi-Kenya

Assistant director in charge of division

Mr. H.M.Mokaya

Kenya bureau of standard
 P.O.BOX 54974
 Nairobi-Kenya

Assistant Director (Fin. & Adm.)

Daniel M.Ndivo

East africa industries limited
 P.O.Box 30062
 Nairobi-kenya

Factory Manager

Simon W. Njoroge

KIWI brands ltd.
 P. O. Box 30457
 Nairobi-kenya

Quality control manager

Thomas O. Miyago

Premier food industries limited
 P. O. Box 41476
 Nairobi-kenya

General manager M.Sc. (food) Tech.

C. I. Roy

RWANDA

Chamber de commerce et
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Minster du commerce
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