

THE PYRETHRUM INDUSTRY DEVELOPMENT STRATEGY
2011 - 2021

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EXECUTIVE SUMMARY

This strategy is a collaborative effort by the pyrethrum industry stakeholders and has been prepared in a participatory consultative process which involved a wide range of stakeholders in the pyrethrum industry. The Tanzania Pyrethrum Industry Development Strategy 2011 – 2021 has been prepared as a result of developments which have taken place within and outside the pyrethrum industry. These developments include the amendment of the Pyrethrum Industry Act of 1997 by the Crop Laws (Miscellaneous Amendment) Act of 2009 and due to the need to implement the new Crop Board reforms and to put into operation the Pyrethrum Regulations of 2010.

In Tanzania, the agricultural sector's share to the GDP for the period 1987-1990 averaged 48.2%, the period 1990-1993 (48.4%), 1994-1198 (50%), 1999-2000 (about 50%) and 2010/11 (24.1%). Compared with other sectors, agriculture has the highest growth Linkages (multiplier effects). This implies therefore that Tanzania cannot really talk Meaningfully of its socio-economic development, poverty reduction, and so on, without Addressing agricultural productivity. Agriculture is indeed the backbone of the country's economy.

This Strategy auger well with the National Agricultural Policy and other key national policy/initiatives such as MKUKUTA, ASDA, ASDP and Kilimo Kwanza. The main Goal of the Policy has always remained to improve the well being of the people whose mainstay and their livelihoods are based on agriculture.

The nation envisions an agricultural sector that by the year 2025 is modernized, commercial, highly productive and profitable, which utilizes natural resources in an overall sustainable manner and which offers effective inter-sectoral linkages. In order to contribute to this long-term Government vision (of year 2025) it will be necessary to transform the pyrethrum industry from that of low productivity into commercialized profitable production system. This Strategy, therefore, suggests interventions to create an enabling and conducive environment for improving profitability of its stakeholders as the basis for improved incomes and poverty reduction.

Currently, the global production of pyrethrum is around 12,000 tonnes per annum. In the next 10 years the production is projected to increase to about 20,000 tonnes p.a. globally in which the countries of Kenya, Tanzania, Rwanda and Uganda are projected to account for almost all the future global increase in production.

Tanzania has the potential to produce over 8,000 tonnes of dried pyrethrum flowers per year. This potential can be realized if elite planting materials can be availed to growers and to go with better crops husbandry including use of fertilizers. Currently Tanzania produces about 4,600 tonnes of dried flowers per annum. In addition, there are about 11,610 hectares currently under pyrethrum production; the immediate plans are to increase the cultivated area especially that under smallholders to about 15,500 hectares.

Productivity in terms of production per unit area and quality is also growing but at a slower pace compared to the total dry flowers production. For example, productivity has increased reasonably from 200kg/ha in 1978/79 to 750 kg/ha in 2010/2011.

The pyrethrum industry in Tanzania comprises of the following main stakeholders:

- (i) Pyrethrum growers
- (ii) District councils,
- (iii) Pyrethrum buyers,
- (iv) Research
- (v) Pyrethrum processors and
- (vi) The Tanzania Pyrethrum Board (TPB).

The industry faces the following universal challenges: **Low productivity, inadequate support to research, poor extension services, low quality of pyrethrum flowers, poor infrastructure, marketing problems and bottlenecks in production.**

The general strategic objective is to increase incomes of the pyrethrum farmers thereby contributing to reduction of rural poverty in the growing areas. This would be achieved through ***(i) increasing production and yield of dried pyrethrum flowers from the existing 200 kg/ha to 1000 kg/ha by the year 2021; (ii) increasing pyrethrin content from the present 1.2% to 3% by the year 2021; (iii) strengthening human and institutional capacities to provide necessary services; (iv) ensuring availability of adequate high yielding planting materials and (v) improving rural roads and storage facilities in the pyrethrum growing areas.***

Strategic Interventions:

- Improved planting materials are the most important prerequisites for increasing pyrethrum production, but current efforts have not been able to meet the demand for the planting materials.
- Promptness and quality of extension services are as important as the pyrethrum crops production process itself. Under normal practices, all activities in the pyrethrum production process require professional extension advice. The activities have to be scheduled within a cropping calendar, which is strictly dependent on weather patterns of the areas under consideration, especially rainfall. Therefore, extension services should take into consideration the quality and timeliness of extension messages delivered.
- Research has a crucial role to play in the development and operationalization of the above-stated pyrethrum industry strategic objectives.
- Smallholder pyrethrum farmers acting alone are at a disadvantage in a liberalized pyrethrum market. It is therefore important that TPB, and Department of Cooperatives under MAFC, promotes and facilitates the formation of growers' associations/primary societies for collective actions in input procurement, marketing of output and eventual direct transportation of flowers to the processing plant.
- Increased capacity for processing flowers to crude extract is required to enable efficient handling of increased flower production envisaged as a result of implementing this strategy. More private investors should be encouraged to invest in pyrethrum flowers processing. Emphasis should be placed on diversification of investment to enable further processing of pyrethrum products. Also, the industry should invite investors to look into the possibilities of installing refineries in Tanzania. At farm level, it is necessary for farmers to be facilitated to acquire and use appropriate drying technologies through a mechanism to be formulated.
- An improved and well-maintained rural infrastructure in the major pyrethrum growing areas is vital for the sub-sector development. Investments in both roads and storage facilities are critical for stimulating increased pyrethrum production.

- Prices and markets of pyrethrum production are crucial factors in determining the increase or decrease in production. In order to avoid problems that might be brought about by low producer prices and unreliable markets during implementation of the strategy, the focus will be on:
 - (i) The TPB ensuring access to market information by farmers and other stakeholders.
 - (ii) The Government to fully facilitate TPB to have access to market information and use this information for production, assessment of market behavior and for the provision of feedback to producers.
 - (iii) Reducing marketing costs by encouraging farmers to deliver pyrethrum flowers directly to processors through their association or cooperative societies.
 - (iv) Establishing a central pyrethrum-content analysis laboratory in order to check on quality of flowers as declared by processing and marketing companies in order to protect farmers against deceit.
- The Tanzania Pyrethrum Board should be strengthened to enhance its capacity to carry out its regulatory functions much more efficiently. To achieve this there is need to provide TPB with working tools including transport facilities and a variety of office equipment as well as training of key staff in management skills and information technology.
- The capacity of the Pyrethrum Industry Development Trust Fund needs to be strengthened so as to enable it fund and run the shared functions with other stakeholders more effectively. The PIDTF is responsible for the coordination, funding and implementation of shared functions in the areas of crop research, crop extension and training services, provision of planting materials and funding of the annual stakeholders' meeting.

Organization and implementation arrangement:

The Tanzania Pyrethrum Board shall be the major overseer in coordinating and monitoring the implementation of the pyrethrum industry development strategy. It will co-ordinate and monitor the performance of programme activities assigned to various respective stakeholders in the industry.

Activities involved in the pyrethrum development programme will be implemented over a period of five years. The Pyrethrum Industry Development Trust Fund shall guide implementation of the proposed activities in collaboration with the Tanzania Pyrethrum Board. The PIDTF will be composed of representatives from the above –mentioned stakeholders, processing plants, marketing organizations and companies, farmer organizations as well as the MAFC.

The PIDTF and other stakeholders will prepare their annual work plans based on this strategy. The PIDTF and TPB shall convene meeting annually to review and approve the industry annual plans. The meeting will as well serve as a forum for commitment of various stakeholders to implement the agreed activities. The overall supervision and monitoring of the programme shall be responsible for supervising and monitoring programme activities. These will be required to provide quarterly progress reports to the TPB headquarters. These reports will be prepared by field inspectors and submitted to the TPB zonal managers.

PRIORITY AREAS OF INTERVENTION:

- (i) Establishment of a clonal multiplication unit (CMU) under PIDTF is a necessary first step to be undertaken; this move will need close assistance from MAFC in terms of expertise and initial financial support. The Unit shall:
 - Organize and coordinate clonal multiplication by different stakeholders including farmers, associations/groups and district councils.
 - Train individuals that do clonal multiplication.

- (ii) TPB should establish and smooth run pyrethrum analysis laboratory to be established at Njombe Township.
- (iii) MAFC should support the operationalization of the tissue culture laboratory at ARI – Uyole, which is a key facility for assisting clonal research and its accelerated release.
- (iv) The Government should make an immediate arrangement to ensure that investment in another crude extract factory is implemented soonest so as to be ready for the expected increase in production to about 6,000 tons by 2013. The Mafinga crude extract factory has a maximum capacity to process 4,500 tons which has already been reached.
- (v) At the same time the industry should initiate dialogue on the possibilities of establishing a pyrethrum refinery here in Tanzania.
- (vi) Invest in research of appropriate pyrethrum driers to be availed to be availed to farmers at affordable price.
- (vii) Starting from this season organize annual pyrethrum good practices campaigns in pyrethrum growing villages; among other practices is to emphasize on quality processing of flowers at farm level as this has been identified as a number one contributor to the farmer incomes.

1:0 INTRODUCTION:

The Tanzania Pyrethrum Industry Development Strategy (PIDS) 2011 – 2021 is a collaborative effort by the Pyrethrum Industry Stakeholders and has been prepared as a result of developments which have taken place within and outside the pyrethrum industry. These developments include the amendment of the Pyrethrum Industry Act, 1997 by the Crop Laws (Miscellaneous Amendment) Act of 2009 and due to the need to implement the new Crop Board Reforms and to put operational the Pyrethrum Regulations of 2010.

One of the major issues in the amendment of the Pyrethrum Industry Act, 1997 is that of recognition by the law of the annual stakeholders meeting and implementation of “shared functions” in the pyrethrum sub-sector. In order to ensure the sustainable implementation of the shared functions in the pyrethrum industry as per the amendment of the Pyrethrum Industry Act, 1997, the pyrethrum stakeholders, through their legally established meetings, signed a Memorandum of Understanding (MOU) to enable implementation of shared functions.

Due to the above developments, the Pyrethrum Industry Development Trust Fund (PIDTF) for funding the implementation of the shared functions was established. This also necessitated the need for the preparation of the Pyrethrum Industry Strategy. As a result, the first draft of the Pyrethrum Industry Development Strategy was prepared and submitted to the board of Trustees of PIDTF which held its meeting in Dodoma on 6-7 August 2009 and appointed a sub-committee to go through the draft strategy. The sub-committee proposed a way forward for the improvement of the strategy to come up with the new pyrethrum industry development strategy 2011-2021.

1.1 Agriculture in The Tanzania Economy:

1.1.1 Importance of Agriculture:

Agriculture is very important to the country's economic and social development for a number of seasons.

- i. About 77.5% of Tanzanias dwell in the rural areas earning their living mostly from agriculture. It is estimated that about 50% of the population in Tanzania is poor, earning less than US\$ 1 per day and over 80% of the poor live in the rural areas of the country. This implies therefore that we cannot really talk meaningfully of secio-economic development and poverty reduction poverty without addressing agriculture. Agriculture is indeed the backbone of our economy.
- ii. In Tanzania, the share of agriculture to the GDP for the period 1987-1990 averaged 48.2%, the period 1990-1993 average 48.4%, 1994-1998 (50%), the period 1998-2000 (about 50%) and 2010/11 (about 24.1%).
- iii. Compared with other sectors, agriculture has the highest growth linkages (multiplier effects).

1.1.2 The Agricultural Policy:

The main goal of the policy has always remained to improve the well-being of the people whose mainstay and their livelihood is based on agriculture. The policy stands to ensure that the direction and pattern of development in the agricultural sector meets economic and social objectives and outputs. It comprehends the importance of competitive markets, with the government providing priority public goods and services and the conservation of the environment as a rational basis for agricultural development. The focus of the policy is now how the government deploys these services to support the private sector in promoting growth and commercialization in the sector. The policy objectives are therefore:

- i. To assure basic food security for the nation and to improve national standards of nutrition by increasing output, quality and availability of food commodities. Food crops will be increased through productivity and area expansion.
- ii. To improve standard of living in the rural areas through increased income generation from agricultural production, processing and marketing.
- iii. To increase foreign exchange earnings for the nation by encouraging the production and increased exportation of cash crops.
- iv. To produce and supply raw materials, including industrial crops while also expanding the role of the sector as a market for industrial outputs through the application of improved production, marketing and processing technology.
- v. To develop and introduce new technologies which increase the productivity of labour and land.
- vi. To promote integrated and sustainable use and management of natural resources such as land, soil, water and vegetation to conserve the environment.
- vii. To develop human resources within the sector in order to increase the productivity of labour and to improve ability, awareness and morale.
- viii. To provide support services to the agriculture sector, especially those that cannot be provided efficiently by the private sector.
- ix. To promote access by women and youth to land, credit, education and information.

Referring from the core policy objectives, it can be observed that the first three objectives aim at ensuring food security and income back-up while the fourth, fifth and the sixth objectives are focusing attention at proper utilization of resources through application of new technological advancements.

The seventh objective recognizes the importance of enhancing the development of human resources. The last but one objective defines the role of the government in providing the services that have so far not been commercialized. However considering the fact that pyrethrum is still one of emerging cash crops, the costs of these services have to be gradually introduced in the cost/price structure of the crop as the production improves. In the meantime, the service provisions have to be made under shared modalities and functions until the industry can bear all the costs. Ideally, the first six objectives can be summed up as emphasizing on exercising proper agriculture through observing the principles of production and marketing.

The Government Agricultural Sector Vision:

The Nation envisions an agricultural sector that by the year 2025 is modernized, commercial, highly productive and profitable, which utilizes natural resources in an overall sustainable manner and which offers effective inter-sectoral linkages.

1.1.3 Government's Strategic Objectives in Agriculture:

In order to achieve the long-term Government vision (of year 2025) it will be necessary to transform the existing subsistence agriculture into commercially profitable production system. The strategy is thus to create an enabling and conducive environment for improving profitability of the agricultural sector as the basis for improved incomes and poverty reduction.

Some of the key areas that will be focused by the Ministry responsible for agriculture includes the following:

- i. In collaboration with the private sector promote and strengthen farmer's organizations.
- ii. Strengthening the capacity of research, training and regulatory institutions so that technical packages such as clones, which for pyrethrum will impact high

pyrethrin content , will be developed and disseminated to farmers through extension services. The extension services will thus inculcate farmers with better drying and storage techniques and encourage farmers to use more fertilizer.

iii. **Improving private sector capacity through:**

- The provision of a conducive legal and administrative framework for private sector investment in key areas of agricultural development.
- Support in training for better agronomical practices, quality factors and in management skills for farmer organizations.
- The involvement of agribusiness in dialogue with the government in matters related to policies, taxation and tariff formulation.

iv. **Strengthening coordination of actors in the sector:**

- An annual conference of stakeholders in the sector organized by the line-ministries will be a consultative forum for receiving and discussing the industry' progress. The forum will also be used for planning and forging ahead the implementation of shared functions.

v. **Improving agricultural research:**

- The already initiated privatization of cash crops research and institutionalization will be accelerated to cover all major commodities.
- Funding agricultural research will be shared among the Central Government, Local Governments, Commodity Boards and the Private sector. Stakeholders will be sensitized to exert a demand on research and to demand quality results from researchers. The PIDTF is an example of stakeholders' instruments to fund specific crop research agenda.

- vi. Improving agricultural extension services:
- Ensuring extension services are adequately provided will remain the primary responsibility of local governments and industry stakeholders through shared-functions arrangements.
 - There will be increasing private sector involvement to complement public extension providers; in the case of pyrethrum industry this can be implemented as one of the shared functions.
- vii. Strengthen agricultural information services
- viii. Facilitating investment and financing in agriculture.
- ix. In order to attract financial resources and to ensure access to credit by farmers following interventions are considered as strategic priorities.
- Promoting microfinance institutions;
 - Establishment of institutional arrangement for financing agricultural investment: A deliberate move will be taken to create investment-banking departments within existing commercial banks or create a new agricultural investment bank as stipulated in KILIMO KWANZA resolution.
 - Promote partnerships between smallholder farmers and agribusiness. The Government will focus its efforts on supporting the private sector's initiatives in establishing out grower and contract farming schemes.

Implementation of incentive mechanism: The agricultural sector Ministries and the Ministry of Finance in consultation with stakeholders will create and implement specific incentive packages for promoting the development of out-grower/contract farming scheme, private investment in agricultural marketing and inputs supply, and the development of small and medium scale agro-processing industries in rural areas. The requisites incentive

mechanism will involve preferential tax regimes, energy tariffs and cost sharing arrangement for rural infrastructure development. The Government will publicize investment policy, guidelines and incentive mechanism in order to promote transparency.

- x. Promote agro processing and rural industrialization.
- xi. Create a conducive administrative and legal environment in this regard four priority focus areas are proposed, namely, reviewing and harmonizing agricultural legislation, streamlining procedures for land acquisition, surveying and demarcating agricultural investment zones and facilitating stakeholder ownership/control of community boards.
- xii. Improving rural infrastructure including rural electrification and communication system.
- xiii. Taxes, levies and fees on the sector: The government will continue to work on the rationalization of the taxation regime in incentives to attract private investments in agriculture.
- xiv. Energy tariffs and oil prices for the agricultural sector are a deterrent to rural processing and a cause for unfavorable trading results in agribusiness. The Government, the Private Oil companies and the Utilities Company (TANESCO) intend to look into this problem on a priority basis.

1.2 World Pyrethrum Situation:

1.2.1. Production:

Pyrethrum production at the global level is around 12,000 tonnes per annum; in the next 10 years the production is projected to increase to average global production of about 20,000 tonnes. The countries of Kenya, Tanzania, Rwanda and Uganda are projected to account for almost all the future global increase in production. About 50% of the projected increase by the East Africa countries is expected from Kenya and Tanzania and the remaining output mostly from Tasmania and Papua New

Guinea. Until last decade, Kenya was the leading producer of pyrethrum extract and used to produce approximately 50% of the world consumption. Other large producers of pyrethrum are Tanzania, Rwanda and Tasmania.

1.2.2 Consumption:

The most traded pyrethrum products include crude extract, pyrethrum powder and pyrethrum marc. Crude Extract contributes about 95% of the pyrethrum trade and the remaining 5% is contributed by pyrethrum powder and pyrethrum marc. The world pyrethrum demand has been increasing steadily for the past five years. The pyrethrum extract is mainly exported to USA, Europe and Asian countries. The world demand for the dry flowers is about 20,000 tonnes and that of pyrethrum extract is at 400 metric tonnes. The production in Tanzania has well been increasing steadily for the past five years. (Table I) whereas is Kenya, Rwanda and Tasmania it has dropped enormously.

The major use for pyrethrum in the US market include pre-and post-harvest sprays for foodstuffs, intestinal parasite control in livestock, shampoos (pets and human) and insect sprays. Since 1940 when synthetic pyrethroids were introduced, over 50 different pyrethroids have appeared in the market, creating competitive pressure on natural pyrethrum. This trend, however, is now beginning to experience a shift as international standards are creating renewed interest in natural pyrethrum, particularly to reduce the maximum residue levels (MRLs) in consumable products.

Table 1: World pyrethrum demand as compared to production in Kenya and Tanzania.

Years	World demand	Production in Kenya	Production Tanzania	Total (Kenya/ Tanzania)
1970/1971	15,178	9,748	2,731	12,479
1974/1975	22,500	15,018	4,741	19,759
1976/1977	16,906	11,434	3,312	14,746
2000/2001	15,000	8,00	1,850	9,850
2005/2006	15,000	2,000	2,800	4,800
2010/2011	15,000	1,000	4,560	5,560

1.3 General Overview of the Tanzania Pyrethrum Industry:

Pyrethrum as a crop was introduced in Tanzania in 1930s and was grown as estate crop in Kilimanjaro, Arusha and Tanga. In the 1960s cultivation of pyrethrum was introduced in the Southern Highlands in the districts of Makete, Mbeya, Njombe, Kilo and Mufindi. The Southern Highlands area now contributes to about 99% of the pyrethrum production in Tanzania.

1.3.1 Importance of the Pyrethrum Industry to Tanzania:

Tanzania has the potential to produce over 8,000 tonnes of dried pyrethrum flowers per year. This potential can be realized if elite planting materials can be availed to growers and to go with better crops husbandry including use of fertilizers. Currently Tanzania produces about 4,600 tonnes of dried flowers per annum.

There are about 300,000 farming families in Tanzania which depend almost entirely on pyrethrum production for their livelihoods. About 99% of pyrethrum produced in Tanzania comes from the Southern Highlands regions of Mbeya, Iringa and Njombe. In these regions, pyrethrum is produced in the district of Mbeya, Ileje and

Rungwe for Mbeya; Kilolo and Mufindi for Iringa; and Makete, Njombe and Ludewa for Njombe. Arusha, Kilimanjaro and Manyara regions produce the remaining amount of total production in the country. The majority of growers are small scale growers who cultivate about 0.4-1.0 ha of land.

The reason for the involvement of so many smallholder farmers in pyrethrum farming is that as a cash crop, the profitability of pyrethrum is substantially higher than other crops commonly grown by farmers in these regions. Specifically, when compared to maize, the profitability from farming pyrethrum is four times higher.

There are about 11,610 hectares currently under pyrethrum production and the immediate plans are to increase the area especially that under smallholders to about 15,500 hectares.

1.3.2 Pyrethrum Production Performance:

Pyrethrum production in Tanzania hit the lowest performance from 1994/1995 season to 1999/2000 season. Competitions from synthetics, poor farming conditions and competition from new market entrants were among the factor which contributed to the downfall.

The turning point came from 2000/2001 season up to now, most probably due to policy changes towards liberalized marketing system which happened at the same time among other factors. However, the quality of the pyrethrin content has also dropped during the same period to 1.2% and sometimes lowers than this.

Since 2006 Tanzania has experienced an increased production of pyrethrum flowers from 1,800 tonnes in 2006/2007 to 2,800 tonnes in 2007/2008, 3,280 tonnes in 2008/2009, 3,900 tonnes in 2009/2010 and 4,580 tonnes during 2010/2011 season. This has been contributed to the fact that since the MGK took over the Mafinga processing plant it has been investing in the development of the crop as well as providing a reliable market. The MGK is a world's top buyer of pyrethrum with 80% of global monopoly.

1.3.3 Productivity:

The first year of a three-year lifecycle of growing the pyrethrum plant is the most crucial one that determines productivity and the future profit levels of farmers. In Tanzania, the pyrethrum productivity in terms of the per unit production and in terms of quality is also increasing but at a slower pace compared to the total dry flower production. For example, productivity has increases reasonably from 200 kilograms per hectare in 1978/1979 to 750 kilograms per hectare in 2010/2011. Table 2 shows estimated productivity trends from 2009 to 2011/2012.

Table 2: Productivity trend in the Tanzania Pyrethrum Industry:

Attribute	2009/2010	2010/2011	2011/2012
Production (kg/ha)	700	750	1,000
Pyrethrin content (%)	1.7	1.6	2.2
Annual production (tonnes)	3,900	4,600	5,600
Average price (Tshs/Kg)	1,400.00	1,700.00	2,000.00

1.3.4 Pyrethrum Industry Stakeholders:

The Tanzania Pyrethrum Industry comprises the following main stakeholders:

(i) Pyrethrum growers:

This group of stakeholders is a cornerstone for the increased production and quality of flowers; but their interest is to get attractive prices as well as to get a reliable market. Growers are also responsible for primary marketing of pyrethrum flowers. For the sake of instilling efficiency and effectiveness, the growers are organized into associations/cooperatives in their respective areas.

(ii) District councils:

These are important organs in forging and carrying out crop development plans. This is normally done through councilors in the pyrethrum growing areas. The district councils also provide extension services to pyrethrum villages as well as building and maintaining the infrastructure such as roads and storage facilities

(iii) Pyrethrum buyers:

These can be private people, farmer associations or primary cooperative societies buying the pyrethrum from the growers and delivering the produce to the processors. They are interested in both quality and quantity of the crop.

(iv) Research:

The Ministry of Agriculture Food Security and Cooperatives through its Agricultural Research Institute, Uyoie, provides basic pyrethrum research in the areas of clonal development, control of pests and disease and agronomic studies for improvement of pyrethrum crop husbandry.

(v) Pyrethrum processors:

This group is interested in a steady supply of dry flowers with high quality and also responsible for secondary processing of pyrethrum flowers into various products such as crude extract, pyrethrum marc, pyrethrum powder and mosquito coils. Currently, there is only one crude extract processor, the Pyrethrum Company of Tanzania (PCT) and there are two grist processors and exporters in Mbeya. Up to now there is no pyrethrum refinery in Tanzania.

(vi) Tanzania Pyrethrum Board:

This is the industry's custodian in its capacity as a government agent with vested responsibility of regulating the industry. The TPB's role and interest is to regulate a robust and sustainable industry for increased flower production with high quality and marketed efficiently.

2:0 CURRENT EFFORT AND RECENT ACHIEVEMENTS IN DEVELOPING THE PYRETHRUM INDUSTRY (SITUATIONAL ANALYSIS):

The pyrethrum industry in Tanzania has gone through a number of changes to attain the success it enjoys today; these changes include the following:

2:1 Restructuring of the TPB:

The Government Restructured TPB in 1998; this was done by abolishing cess contributions of finance the running costs of the Board and went further to finance it 100%. The more recent development is that of the amendment of the Crop Boards Act, of 2009 which resulted to new pyrethrum industry Regulations of 2010.

2:2 Establishment of the Pyrethrum Industry Development Trust Fund (PIDTF):

The fund was re-established in 2009 with the main objective to finance the shared non-regulatory activities in the pyrethrum industry. The PIDTF was revived through a memorandum of understanding signed between stakeholders to coordinate and fund crop research, crop extension, crop promotion and annual stakeholders meetings. The fund gets financial resources through contribution of 3% by farmers and 3% contributed by each of the processing factories made from each kilogram of the pyrethrum purchased.

2:3 Formatting of the Pyrethrum Council of Tanzania:

The Pyrethrum Council of Tanzania was reorganized in 2001 with the main responsibility of negotiating and indicative price for the crop which is agreeable to all stakeholders.

2:4 Registration of Pyrethrum Growers Association:

The TPB has in the past facilitated registration of pyrethrum farmers through their primary cooperative societies. The board should therefore continue with this activity so as to forge economies of scale among farmers as a result strengthen their position in the pyrethrum business.

2:5 Pyrethrum Processing:

In 2006 a strategic partner from USA (MGK) made a significant investment at Mafinga taking over Tanzania Pyrethrum Processing and Marketing Company Limited (TPPMCL). The new investor has rehabilitated the factory to its installed capacity to process about 4,500 tonnes of pyrethrum flowers per annum. The company also went further to revamp and improve the Tanzania Pyrethrum Industry through investing in research, extension and marketing systems.

2:6 Pyrethrum Research:

Research being an important factor for the pyrethrum development in Tanzania, ARI-Uyole has conducted considerable research activities especially in the area of clonal development. This effort has resulted into development of seven clonal materials with desirable attributes such as high fresh flower yield, high dry flower content and high dry matter content. They can produce more than 500kgs of pyrethrum flowers per hectare, have pyrethrin contents exceeding 1.5% and can grow at a wider range of altitudes (800m-2600m).

More useful research has been concluded in the area of use of pyrethrum marc or grist as botanical insecticides in field crops and in storage of maize and beans. The materials are used effectively where maize or beans are stored using local storage facilities either in cobs or shelled.

3:0 KEY CHALLENGES FACING PYRETHRUM INDUSTRY:

Tanzania Pyrethrum Industry faces the following universal challenges:

3:1 Low Productivity:

As noted before, the first year of a three-year lifecycle of growing the pyrethrum plant is the most crucial one that determines productivity. In fact, the genetic composition of the planting material contributes to as much as 90% of the pyrethrin content of the dry flower, which is the major profit driver. Therefore, it is crucial for pyrethrum farmers to have access to competitively priced, high quality planting material at the outset.

As a result of this, the overwhelming response of the farmers has been to improvise the available materials for the lack of better ones: They normally split their own cultivated plants and use them as planting materials which give increasingly inferior yields per unit area.

Planting materials currently used by farmers produce an average of 200kgs of dried flowers per hectare compared to a potential of 500-800 kgs of flowers per hectare. Other factors include declining soil fertility and inadequate expertise at farm level due to inadequate extension services.

3.2 Inadequate Support to Research:

The pyrethrum research at ARI – Uyole is under-funded and as a result there is inadequate technology development and transfer from research to farmers; for example, failure to accelerate the multiplication of improved planting materials developed at ARI-Uyole.

3.3 Poor Extension Services:

The extension services provided in the pyrethrum growing areas are constrained by inadequate transport facilities for the extension staff and inadequate number of knowledgeable staff.

3.4 Low Quality of Pyrethrum Flowers:

The drying technology currently in use by farmers is inappropriate which contributes to loss in quality of the flowers. Failure to pay final payment that is usually based on quality has been a disincentive to growers to put an extra effort in producing quality flowers.

3.5 Poor Infrastructure:

Road conditions in the pyrethrum growing areas of Tanzania are so poor during rainy seasons such that it becomes impassable. Consequently, loads of pyrethrum flowers are stranded in villages and lose quality considerably; as a result, growers miss the second payment.

3.6 Marketing Problems:

Lack of access to regular market information is considered to be a major problem in developing production plans. Delayed information about new prices for each year affects production for the next two seasons. Delays in effecting second or final sale payments to farmer are one of the key challenges hindering pyrethrum development in Tanzania.

The issue of high production costs incurred by the processors that is usually used as a factor in determining producer price has a negative impact on the pyrethrum crop development as well.

3.7 Bottlenecks in Production:

Existence of high levels of local production costs, levies and taxes imposed on services rendered to the industry, which are again burdened to growers are detrimental to increased production and productivity in the industry.

One of the most limiting components for pyrethrum farming is labor both crop maintenance and harvesting. Previous research on pyrethrum farming has shown that proper use of herbicides that have proven to be effective in controlling weeds can possibly reduce labor input by over 57%. A closer look at current pyrethrum farming practices suggests that labor inputs can range from 47% to as much as 70% of the total cost of farming, particularly if the costs of farming are averaged over the entire lifecycle of a plant. In this context, proper use of herbicides, combine with in-field technical assistance to improve labor productivity, are critical factors associated with improving the competitiveness of pyrethrum production. As indicated by the value chain analysis, no resources are allocated to drying because the high cost of fuel is forcing farmers to rely on the sun for drying their pyrethrum-flower harvest. It is estimated that sun drying requires three full days of sunshine combined with a total of half-day labor to rake the flowers for even drying. Blow drying, on the other hand, costs more while sun drying can only achieve a 50% moisture content. Given the abundance of sunshine in the country, blow drying does not necessarily offer any efficiency gains, except when the country experiences sustained rains during the harvest period.

4.0 Strengths, Weakness, Opportunities and Threats (SWOT):

In-order to address the above challenges in the pyrethrum industry, a SWOT analysis has been performed after analyzing key stakeholders in the industry as shown in Table.

Table 3: SWOT Analysis for Tanzania Pyrethrum Industry

Strength	Weakness	Opportunities	Threats
<p>Existence if the agricultural policy with strong focus on cash crops and support to private sector in promoting growth and commercialization.</p> <p>Private sector partnership especially in the implementation of shared functions.</p> <p>Existence of a research unit at the Agricultural Research Institute (ARI) – Uyole which caters for the industry’s research needs.</p> <p>Existence of investors with the necessary technology and financial capacity.</p> <p>Plenty of suitable land for pyrethrum production.</p> <p>Presence of experienced pyrethrum growers.</p> <p>Opportunities to further improve pyrethrum quality and so to earn more dollars.</p> <p>Availability of best bets pyrethrum planting materials.</p> <p>Willingness of stakeholders to support and fund shared function through PIDTF.</p>	<p>Use of low yielding planting materials.</p> <p>Inadequate supply of planting materials to farmers.</p> <p>Inadequate support to research that pulverize technology development and its transfer to farmers.</p> <p>Inadequate extension services.</p> <p>Low use of fertilizers which result in low production.</p> <p>Inappropriate drying technology which results in low pyrethrins content.</p> <p>Poor roads and storage infrastructure which cause prolonged storage of flowers at farm level and as a result contribute to quality deterioration.</p> <p>Delays in effecting second payments or their non-payment at all.</p> <p>Inadequate credit and supply system.</p> <p>Inadequate dissemination of market information.</p>	<p>Presence of a large international pyrethrum market that is not satisfied and which continues to grow as the world becomes environmentally conscious.</p> <p>The industry is a high priority investment sector.</p> <p>Tanzania has the potential of becoming a low-cost and efficient pyrethrum producer as well as a major exporter.</p> <p>Potential to gain price premium.</p>	<p>Fluctuations of world pyrethrum market prices.</p> <p>Competition with other major producers.</p> <p>Increasing cost of inputs.</p>

5.0 STRATEGIES FOR DEVELOPING THE PYRETHRUM INDUSTRY:

5:1 Strategic Objectives:

The general strategic objective is to increase incomes of the pyrethrum farmers thereby contributing to reduction of rural poverty in the growing areas. This would be achieved through (i) increasing production and yield of dried pyrethrum flowers from the existing 200 kilograms per hectare to 1000 kilograms per hectare by year 2021; (ii) increasing pyrethrin content from the present 1.2% to 3% by year 2021; (iii) strengthening the human and institutional capacities to provide necessary services; (iv) ensuring availability of adequate high yielding planting materials and (v) improvement of rural roads and storage facilities in the pyrethrum growing areas.

5.2 Strategic Interventions:

5.2.1 Provision of better planting materials:

Improved planting materials are the most important prerequisite for pyrethrum production increase. Current efforts have not been able to meet the demand for the planting materials, in order to ensure that improved planting materials are adequately made available to growers; the following strategies should be undertaken:

- That a stakeholder/government funded clonal multiplication unit equipped with top notch specialists should be established to undertake, coordinate and ARI-Uyole should be relieved of this function so as to concentrate on research issues.
- Facilitate district councils to carry out surveys to determine exact existing areas of production and hence enable estimation of actual requirements for planting materials. The surveys would also look into anticipated expansion of the future production areas. Currently, actual demand for better planting materials is yet to be established.

- To start with, PIDTF should request the MAFC to fund a one-season seed requirement as a requisite short-term strategy prior to mass multiplication of the improved clonal materials. This is imperative as growers cannot wait.
- Facilitate ARI – Uyole to operate a well-equipped tissue culture research laboratory so as to accelerate research on improved planting materials and therefore speed-up their delivery to farmers as mother plants for further multiplication and production of planting materials.
- As a short term measure, promote on-farm seed production by selected farmers in all pyrethrum-producing areas.
- Promote on-farm clonal multiplication by selected farmers in major pyrethrum growing areas.
- Encourage participation of the private sector in production and distribution of superior planting materials.

5.2.2 Provision of Better Extension Services:

Promptness and quality of the extension services are as important as the pyrethrum crop production process itself. Under normal practices, all activities in the pyrethrum production process require professional extension advice. The activities have to be scheduled within a cropping calendar, which is strictly dependent on the rainfall and related weather patterns of the areas under consideration. Therefore extension services should take into consideration of quality and timeliness of extension messages delivered.

For the extension staff to be affective they need to be facilitated by equipping them with operational facilities including transport and illustrative tools. They also need well prepared guidelines that define the strategies and approaches for effective and delivery of agricultural extension services to farmers.

The following need to be done to ensure better extension services to pyrethrum growers:

- i. Encourage pyrethrum growers associations and primary cooperative societies to establish farm input centers in all pyrethrum producing areas in the country.
- ii. Facilitate district councils to carry out inventory of extension staff and undertake redeployment of the same to the pyrethrum producing areas with staff deficit.
- iii. Conduct a training needs assessment and provide refresher courses for extension staff on better pyrethrum production practices at the Uyo Agricultural Training Institute.
- iv. Prepare and distribute to extension staff and farmers booklets on improved pyrethrum crop husbandry practices.
- v. Conduct a Training of Trainers (ToT) course for farmers on improved production, storage and processing practices. Only farmers with sound experience in pyrethrum growing should be selected for the course. Upon completion the trained farmers should train their fellow farmers. It is proposed that part of the trust funds should be used for this purpose.
- vi. Provide transport facilities to extension staff responsible for pyrethrum crop (district subject matter specialist and staff based in the production villages).
- vii. Improve supervision of the village extension workers by ensuring that they have work plans and monitor their performance based on these plans.
- viii. Facilitate village extension officers (VEOs) to monitor implementation of extension messages by farmers.

5.2.3 Strengthening Pyrethrum Research:

Research has a crucial role to play in the development of the pyrethrum industry and in contributing towards the achievement of the above strategic objective. As such pyrethrum research activities will need to be strengthened through the following:

- (i) Strengthening a tissue culture facility at ARI-Uyole;
- (ii) MAFC to be requested to establish basic Pyrethrum research activities at ARI-Selian in Arusha to cater for the Northern Zone.
- (iii) Establishing demonstration sites and on-farm research field on selected farmer fields.
- (iv) Building capacity of researchers to undertake pyrethrum research activities efficiently.
- (v) Facilitating research on improved drying technologies.
- (vi) Strengthen the shared function spirit through PIDTF so as to make the public and private sectors participate effectively in pyrethrum research activities.

5.2.4 Strengthening PGA and Primary Co-operative Societies:

Smallholder pyrethrum farmers acting alone are at a disadvantage in a liberalized pyrethrum market, It is therefore important that the government underscores the need for facilitating the formation of growers association/primary societies for collective action in input procurement, marketing of output and eventual direct transportation of flowers to the processing plant. This is potentially a very important collective effort of the growers to process quality flowers and their delivery to the factory as one big lot under one identity and therefore facilitate a second payment. The following strategies should be implemented to strengthen the existing PGAs and Primary Cooperative Society (PCs).

- i. Educate members on participatory co-operative approaches;
- ii. Build capacity of PGAs and Co-operative leaders on financial management, and organizational and management skills.

iii Encourage formation of PGAs/Co-operatives based on voluntary and democratic principles.

iv. In collaboration with rural financial services programmes, formulate a credit programme for pyrethrum growers to enable them acquire such gear as portable dryers and tray wires.

v. Sensitize PGAs/Primary co-operatives to deliver their members' crop to the processing plants directly.

5.2.5 Improvement of Pyrethrum Processing:

Increased processing capacity is required to enable handling of increased pyrethrum flowers resulting from implementation of this strategy. More private investors should be encouraged to invest in pyrethrum-flower processing. Emphasis should be placed on diversification of investment to enable further processing of pyrethrum products. Also the industry through TPB, should invite investors to look into the possibilities of installing refineries in Tanzania. At farm level, it is necessary for farmers to be facilitated to acquire and use appropriate drying technologies through a mechanism to be formulated.

5.2.6 Improvement of Rural Infrastructure:

Good and well developed and maintained rural infrastructure in pyrethrum growing areas is vital for the sub-sector development. Investments in both roads and storage facilities are critical to stimulating increased pyrethrum production. The cost of maintaining road networks and constructing and maintaining storage facilities such as godowns cannot be met by the pyrethrum farming communities without the assistance of the government, the private sector as well as development partners. The PIDTF should work with the Government to ensure the availability of funds to support this important necessity, whose major aim is to provide motivation to pyrethrum growers to produce more. Strategic actions under this intervention would therefore be to:

- (i) Encourage participation of the district councils and private sector in constructing and rehabilitating storage facilities and strategic access roads.

- (ii) Sensitize PGA and primary co-operative societies to carry out regular maintenance of storage facilities and feeder roads in collaboration with district councils.

5.2.7 Strengthening Pyrethrum Marketing:

Prices and markets of pyrethrum production are crucial factors in determining the increase or decrease in production. In order to avoid problems that might be brought about by low producer prices and unreliable markets during implementation of the strategies, the focus will be on the following:

- (i) TPB ensuring access to market information by farmers and other stakeholders.
- (ii) The Government to fully facilitate TPB to have access to market information and use this information for production, assessment of market behavior and for the provision of feedback to producers.
- (iii) Reducing marketing costs by encouraging farmers to deliver pyrethrum flowers directly to processors through their association or cooperative societies.
- (iv) Establishing a central pyrethrum-content analysis laboratory in order to check on quality of flowers declared by processing and marketing companies as well as to protect farmers against deceit.

5.2.8 Strengthening TPB:

The objective of this intervention is to strengthen the capacity of TPB to carry out its regulatory functions much more efficiently. To achieve this, there is a need to provide TPB with working tools including transport facilities and a variety of office equipment as well as training of key staff in management skills and information technology. To enable TPB acquire a modern laboratory itself should be full equipped with essential equipment and with qualified staff. The laboratory should be established in

the Southern Highlands where production of the pyrethrum flower is high and near the processing factory(s). The plan to locate the laboratory at Njombe Township is imperative because of its proximity to Mafinga Processing Plant and future Mbeya plants. A chemist and laboratory technicians should be trained now so as to be ready to man the laboratory. Also, two support staff – one for each zonal office – should be recruited immediately. In order to enhance the capacity of the TPB to effectively carry out its regulatory functions, the Government should ensure that the TPB's quarterly fund transfers are effected promptly and regularly.

5.2.9 Strengthening PIDTF:

The capacity of PIDTF need to be strengthened so as to enable it fund and run the shared functions more effectively.

The PIDTF is responsible for the coordination, funding and implementation of the shared functions in the areas of crop research, crop extension and training services, provision of planting materials and financing the annual stakeholder meetings.

There is therefore a need for all stakeholders to provide necessary support to PIDTF so as to enable it deliver the services needed for the industry. The Government, for instance, has to support the accelerated multiplication of pyrethrum best bets planting materials available at ARI-Uyole as it is doing for the coffee and tea industries. The most urgent support should be that of supporting smooth running of a tissue culture laboratory at ARI – Uyole as well as supporting staff training for this purpose.

The other stakeholders on their part are supposed to continue give their contributions to this noble goal through payments accrued from crop sale proceeds (3% farmers and 3% processors).

6.0 ORGANIZATIONAL AND IMPLEMENTATION ARRANGEMENTS:

6.1 Organization and Management Arrangement:

The Tanzania Pyrethrum Board would be the major overseer in coordinating and monitoring the implementation of the Pyrethrum Strategic Plan. The TPB would coordinate and monitor the performance of programme activities assigned to various respective stakeholders in the industry.

In the course of programme execution, the TPB staff based in the Southern and Northern pyrethrum-producing zones would work closely with the village extension officers in ensuring that appropriate extension messages are delivered to farmers in time. The TPB at its headquarters will co-ordinate the activities at national level to ensure smooth implementation of the plans.

The annual meetings of the pyrethrum stakeholders would be used to review progress on the programme's implementation. The roles and responsibilities of main stakeholders are as described hereunder:

i. Ministry of Agriculture Food Security and Cooperatives:

- Solicit and allocate funds for the proposed pyrethrum research activities.
- Assist the TPB to seek donor assistance in funding the planned interventions;
- Encourage investors to invest in the industry including agro-processing;
- Conduct training needs assessment and train extension staff and pyrethrum growers through Uyole Agricultural Training Institute;
- Develop and distribute instructional materials on improved pyrethrum production practices;
- Provide technical backstopping;
- Enable TPB to collect and disseminate pyrethrum marketing information;
- Train the pyrethrum growers in participatory co-operatives and other cooperative issues;
- Train farmer organization leadership on organizational and management skills.

ii. Tanzania Pyrethrum Board:

- Co-ordinate, monitor and evaluate the implementation of the proposed interventions.
- Strengthen the pyrethrum inspectorate services to ensure that all stakeholders adhere to the laid down laws and regulations governing the industry.
- Organize annual pyrethrum stakeholder meeting to deliberate on the programme implementation.
- Foster good relationship among the pyrethrum stakeholders dealing with extension services, research and credit.
- Develop an elaborate implementation plan by extracting key areas from this Strategic Plan, specifying activities to be implemented during the year, the timeframe, required inputs and outlining expected outputs.
- Provide transport facilities to field inspectors.
- Establish and run a central pyrethrum content analysis laboratory in Njombe.

ii. District Councils:

- In collaboration with beneficiaries, rehabilitate and maintain key infrastructure and facilities such as roads and storage facilities/marketing centres.
- Redevelopment of the extension staff.
- Ensure maintenance of rural roads/storage facilities in the pyrethrum producing areas in collaboration with local communities.
- Monitor the programme implementation progress at village and district levels.
- Supervise extension staff performance based on work plans.
- Mobilize PGAs and Primary Cooperative Societies (PCS) to open and operate pyrethrum input shops.
- Mobilize the formation of SACCOs.

6.2 Implementation Arrangements:

Activities involved in the pyrethrum development programme will be implemented over a period of five years. The Pyrethrum Industry Development Trust Fund shall guide implementation of the proposed activities in collaboration with the Tanzania Pyrethrum Board. The PIDTF will be composed of representatives from the above, mentioned stakeholders, processing plants, marketing bodies and companies, farmer organizations as well as the MAFC.

The PIDTF and other stakeholders will prepare their annual work plans based on this strategy. The PIDTF and TPB shall convene annual meeting to review and approve the industry annual plans. The meeting shall as well serve as a forum for commitment of various stakeholders to implement the agreed activities. The overall supervision and monitoring of the programme would be the responsibility of TPB. At zonal level, the TPB zonal managers shall undertake supervision and monitoring of programme activities. They will be required to provide quarterly progress reports to the TPB headquarters. These reports shall be prepared by the field inspectors and submitted to the TPB's zonal managers.

7:0 PRIORITY AREAS OF INTERVENTION:

- (i) Establishment of a Clonal Multiplication Unit (CMU) under PIDTF is a necessary first step to be undertaken; this move will need close assistance from MAFC in terms of expertise and initial financial support.
 - The unit shall have to organize and coordinate clonal multiplication
By farmers, associations, groups, district councils, and so on.
 - The unit shall have to train clonal multiplication individuals.
- (ii) TPB should establish and smooth run pyrethrum analysis laboratory to be established at Njombe Township.
- (iii) The MAFC should support the operationalization of the tissue culture laboratory at ARI – Uyole, which is a key facility for assisting clonal research and its accelerated release.
- (iv) The industry should make an immediate arrangement to ensure that investment in another crude extract factory is implemented soonest so as to be ready for the expected increase in production by 2015.
- (vii) Invest in researching appropriate pyrethrum driers to be availed to farmers at affordable prices.
- (viii) Starting from this season (2011/12) organize annual pyrethrum good practices campaigns in the pyrethrum growing villages. Among other practices, is to emphasize on quality processing of flowers at farm level as this has been identified as a number one contributor to attractive the farmers' incomes.