



# **Performance Review Report**

**Farm Mechanization Research Centre  
2016-2018**

**PREPARED FOR  
NATIONAL SCIENCE & TECHNOLOGY  
COMMISSION**

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## Abbreviations

ANTAM	Asian and Pacific Network for Testing of Agricultural Machinery
AP	Action Plan
CEDA	Chief Engineer of Department of Agriculture
CP	Corporate Plan
CSAM	Centre for Sustainable Agricultural Mechanization of the ESCAP
DOA	Department of Agriculture
DGA	Director General of Department of Agriculture
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
FMRC	Farm Mechanization Research Centre
GOSL	Government of Sri Lanka
GTZ	German Government's Agency for Technical Corporation
HARTI	Hector Kobbekaduwa Agrarian Training and Research Institute
M & E	Monitoring and Evaluation
MIS	Management Information System
NASTEC	National Science and Technology Commission
NFPP	National Food Production Program
PDOA	Provincial Department of Agriculture
R & D	Research and Development
SAR	Self- Assessment Report
S & T	Science and Technology
SLEBB	Sri Lanka Engineering Service Board
SME	Small and Medium Entrepreneur
SWOT	Strengths, Weaknesses, Opportunities, and Threats Analysis



## **Acknowledgement**

The Performance Review Panel wishes to thank the National Science and Technology Commission (NASTEC) for the trust it placed on the panel to perform this review. It is grateful for the guidance provided by the NASTEC to carry out the review in accordance with the Review Manual Guidelines.

We sincerely thank the Deputy Director, senior engineering staff comprising four engineers and all technical and other staff of the FMRC who assisted the Review Panel during their visit to Maha Illuppallama. Review Panel wishes to place on record its appreciation for the assistance provided by the Director General of the Department of Agriculture, Dr. W M W Weerakoon and Chief Engineer, Eng. C L Rajapajse who provided valuable information that cleared some doubts the Review Panel had during the evaluation.

We also acknowledge all stakeholders of the FMRC for participation at the stakeholder meeting (held at the Hector Kobbekaduwa Agrarian Research and Training Institute) representing the Department of Agriculture, other Government Departments, Statutory Boards and Authorities, Private sector, Provincial departments of agriculture, Farmers and Entrepreneurs, representatives from JAICA and Academics from Universities, University Colleges, Technical colleges etc. Valuable inputs were received from stakeholders, which were very important in conducting this comprehensive review.

Review Panel wishes to place on record its sincere appreciation of the support extended by Acting DG/ NASTEC, Ms. D Nandanie Samarawickrama. Assistance provided by Senior Scientist Dr. Kalpa Samarakoon who worked tirelessly with the Panel throughout the evaluation process and attended to all logistical arrangements is praiseworthy and is gratefully acknowledged. Thanks are due to all others who contributed to the preparation of the final report of the review.



## **Executive Summary**

Farm Mechanization Research Centre situated at Maha Illuppallama is an institution functioning in the Department of Agriculture (DOA). Its beginnings are traced to the late 1960s when the DOA was promoting the use of agricultural machinery such as tractors in agriculture and had been known as the 'Design and Testing Unit' of the DOA at the time. With its upgrading undertaken with the infusion of funding from the Government of the Federal Republic of Germany through the German Government's Agency for Technical Corporation (GTZ) 1981, it came to be formally known as the Farm Mechanization Research Centre (FMRC). At present FMRC is working to promote appropriate agricultural mechanization in Sri Lanka by introducing farm Mechanization technology to reduce cost of production, improve quality, enhance productivity and increase volume of agricultural products.

The independent panel of four members appointed by NASTEC with the consensus of FMRC conducted the institutional review during the period June to September 2019. The general objective of the review was to assess how effectively the institute has utilized resources to carry out mandated activities and projects to produce outputs that are relevant to its stakeholders and contribute to the national development. With the aim of enhancing its performance in future, the review also includes some recommendations needed to strengthen the weak areas.

### **I. The Agricultural Sector**

The agricultural sector is the most important largest economic contributor accounting for about US\$ 25 billion to the Country's GDP and 20 % of export earnings. The agricultural sector faces such major challenges as low profitability, difficulties in marketing of the produce, labour shortage arising from the poor social recognition of its workforce etc. The aforementioned problem could be mitigated by mechanization of agricultural processes which also could lead to maximize profitability. Having understood this reality, steps had been taken to establish a Farm mechanization scheme in 1982 with a grant awarded by the Government of Germany.

### **II. The Farm Mechanization Research Centre (FMRC)**

At present, the FMRC is under the purview of DOA and managed by a Deputy Director of the FMRC who is a well experienced Chartered Mechanical Engineer who reports to the Chief Engineer of DOA. In order to carry out its mandated functions, the FMRC is equipped with sections such as Research and Development, Testing and Evaluation,



Agricultural and Industrial Extension, Farm machinery Maintaining and Repairing, and also an Administrative section. In addition, FRMC has in its possession a conference hall, workshop and other ancillary support service structures.

Recently established Testing Centre with reasonably well equipped laboratory facilities is a very useful facility for the stakeholders. Once major repair work is completed to the existing quarters, a substantial number of quarters could be made available to provide living accommodation to a large section of the staff who are in dire need of such facilities. The performance of the Institute appears to be impeded by the absence of the leadership with authority and for want of due recognition from the higher management of the DOA. Overall weak R & D management, poor inter-departmental interaction, and conflicts among the personalities at the DOA are some of the negative factors which may have contributed to the underperformance of this valuable research Centre.

### **III. Research and development activities**

As it could be seen from the poor portion of budgetary allocations made available to FRMC, it is very clear that investment for R&D from the state is grossly inadequate in the research field for farm mechanization. The DOA should strive to do a comprehensive restructuring process which shall include identification, execution and performance review process for prioritized R & D work together with allocation of adequate funds required for the tasks. The R & D output of the Centre has been severely hampered by financial resource limitations and lapses in project management and supervision. The management shall make all endeavors in order to improve output through identification of priorities in consultation with stakeholders, other related institutes and universities, especially encouraging Public-Private partnership programs.

### **IV. Strengthening Farm Mechanization R & D**

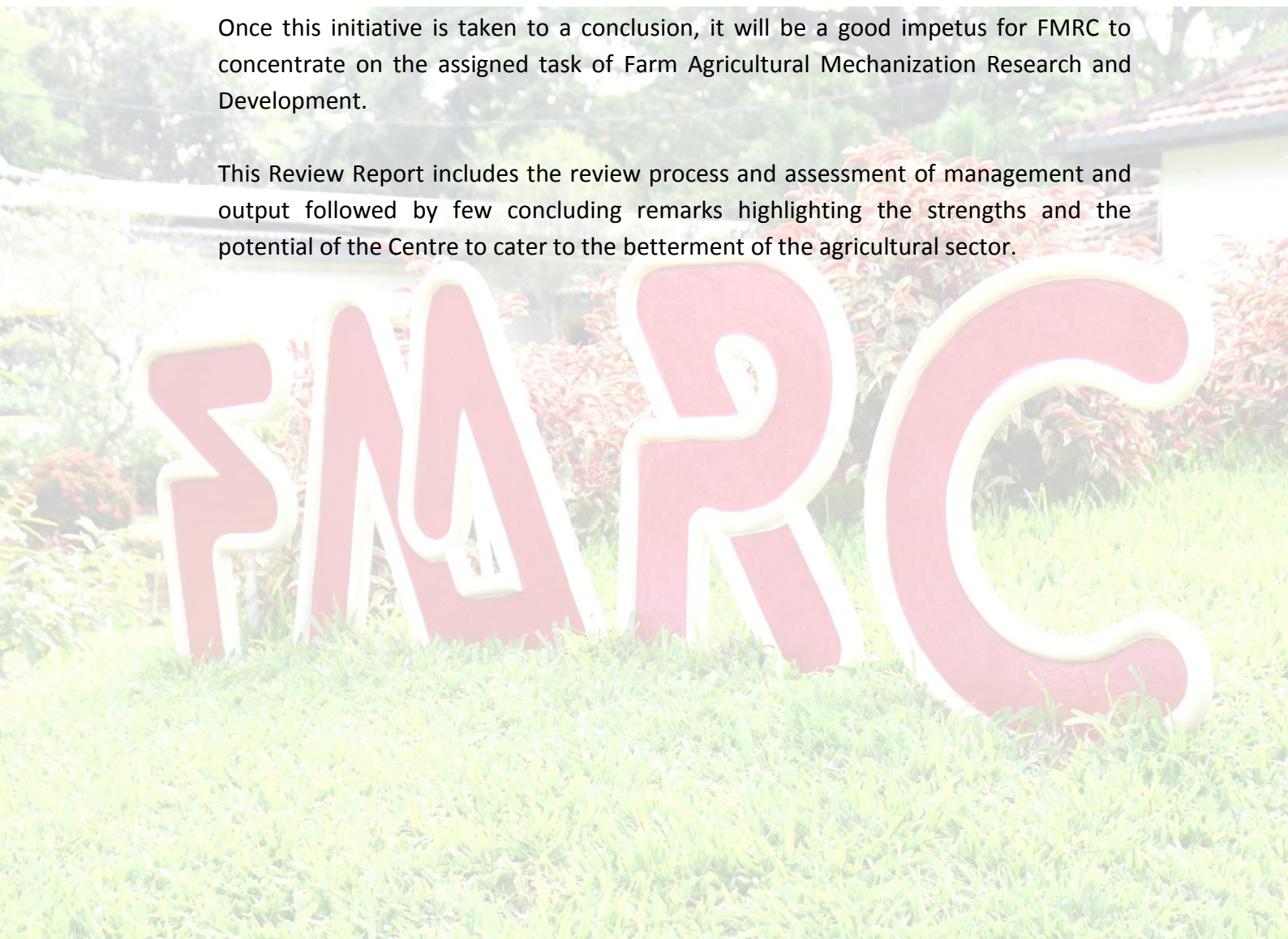
Meetings of the 'Directorate' are conducted by the DGA on regular basis at Peradeniya, Kandy. These meetings are attended by all Heads of Institutions within the DOA including all Additional Directors General in the DOA, Chief Engineer, Deputy Director/ FMRC, etc. Records made available to the Review Team by the DGA show that the Directorate has been concerned about the 'Strengthening Farm Mechanization R & D'. DGA had appointed a Committee (on 09<sup>th</sup> June 2018) under the Chairmanship of both Additional ADG/Research, ADG/Development and committee thus appointed comprised D/E&TC, Chief Engineer and DD/ FMRC with a view to



formulating a Proposal elaborating the 'Ways and means of strengthening Farm Mechanization R & D setup and integrating it into Research, Training and Development streams'. At the meeting of the Directorate held on 02<sup>nd</sup> March 2019 the composition of the Committee had been changed to bring in D/NMRC as its Chairman and D/FCFDI and D/RRDI and the Accountant (Assets Management) as members. It had been further reported at the meeting of the Directorate held on 17<sup>th</sup> May 2019 that the report this Committee would be submitted shortly.

Once this initiative is taken to a conclusion, it will be a good impetus for FMRC to concentrate on the assigned task of Farm Agricultural Mechanization Research and Development.

This Review Report includes the review process and assessment of management and output followed by few concluding remarks highlighting the strengths and the potential of the Centre to cater to the betterment of the agricultural sector.





## **1.0 INTRODUCTION**

Farm Mechanization Research Centre situated at Maha Illuppallama is an institution functioning in the Department of Agriculture (DOA). Roots of the FMRC can be traced to the late 1960s when the DOA was promoting the use of agricultural machinery such as tractors in agriculture and had been known as the 'Design and Testing Unit' of the DOA at the time. With its upgrading undertaken with the infusion of funding from the Government of the Federal Republic of Germany through the German Government's Agency for Technical Corporation (GTZ) 1981, it came to be formally known as the Farm Mechanization Research Centre (FMRC). At present FMRC is working to promote appropriate agricultural mechanization in Sri Lanka by introducing farm Mechanization technology to reduce cost of production, improve quality, enhance productivity and increase the volume of agricultural products.

FMRC functions under the Chief Engineer of DOA (CEDA) who reports to the Director General, DOA (DGA). They are both located in Peradeniya, Kandy. The main areas of activities of FMRC are;

- Identifying mechanization needs according to priorities in different farming systems
- Certification of agricultural machinery
- Selection and testing of promising machinery and implements with regard to their construction, functions, safety, economic and sociological factors
- Development, modification and adaptation of agricultural machinery and implements to suit local conditions
- Prepare technical drawings, test report and instruction and manuals for selected implements
- Transfer technology to local manufacturers and enhance their capabilities in production of appropriate agricultural machinery and implements, and
- Helping agricultural extension and other agencies to popularize agricultural mechanization technologies among farmers and other users.

In order to carry out the above functions, the FMRC is equipped with the following sections.

1. Research and Development section
2. Testing and Evaluation section
3. Agricultural and Industrial Extension section
4. Farm machinery Maintaining and Repairing section, and
5. Administrative section



## 1.1 Organizational Structure and Staff of FMRC

Deputy Director appointed by Sri Lanka Engineering Service to the DOA, who functions as the Head of the FMRC reports to the CEDA. Other senior staff is limited to five engineers, all of whom are Mechanical Engineers, appointed from the Sri Lanka Engineering Service. Four of them are Chartered Mechanical Engineers, by virtue of the fact that they are members of the Institution of Engineers, Sri Lanka.

Although the approved cadre provides for a number of positions from the Sri Lanka Technical Service such as Research Assistant, Engineering Foreman, Draftsman, Farm Mech. Instructor, Agricultural Instructor, Technical Assistant and Inspector of Works are indicated, only a few Agricultural Instructors (02), Technical Assistants (09) are available. The total staff strength for the year 2018 is 95 and only 67 positions have been filled as per Table given below.

**Table 1: Present Staff Strength of FMRC**

Number of Employees And Category	2016			2017			2018		
	Cadre*	Filled	Vacant*	Cadre*	Filled	Vacant*	Cadre	Filled	Vacant
Engineer Class I		01			01		01	01	--
Mechanical Engineer		03			03		03	04	Excess
Assistant Director of Agriculture (Research)		-			-		01	--	01
Development Officer		-			-		01	--	01
Program Assistant (Agriculture)		-			-		02	--	02
Agricultural Instructor		02			02		02	02	--
Engineering Assistant		-			-		04	--	04
Management Assistant		03			02		03	03	--
Technical Assistant (Engineering)		08			09		02	03	Excess
Technical Assistant (Extension)		-					04	03	01
Driver		03			03		04	03	01
Tractor Operator		-			-		02	01	01
Store man		01			01		01	01	--
Machinist		05			03		08	02	06



Mechanic		03			05		06	06	--
Carpenter		01			01		02	02	--
Plant Helper		01					01	02	Excess
Technician		05			05		07	05	02
Office Employment Service							01	01	--
Watcher		03			03		04	03	01
Unskilled Labourers		26			26		35	24	11
Dept. Contract Labourers		02			02		02	02	--
<b>Total</b>		<b>69</b>			<b>68</b>		<b>95</b>	<b>67<sup>#</sup></b>	

\* Information has not been provided by FMRC (According to the SAR submitted)

# This is as given by FMRC (According to the SAR submitted for the year 2018) and does not tally with the total value of 68

The organizational structure as provided to the Team by the Deputy Director is presented in Annexure I.



## 2.0 PROCEDURE ADOPTED FOR PERFORMANCE REVIEW

The Review has been assigned to a Panel of Reviewers by the National Science and Technology Commission (NASTEC) in keeping with the powers vested in it by the Science and Technology Development Act No. 11 Of 1994 mandating it with the task of reviewing the progress of Science and Technology (S&T) Institutions.

The Panel appointed by the NASTEC comprises the following four members,

Prof. N R Arthenayake	Emeritus Professor of Mechanical Engineering, The Open University of Sri Lanka, Nawala, Nugegoda
Dr. Susantha Siriwardena	Deputy Director- Research (Technology), Rubber Research Institute, Ratmalana
Eng. K Y H D Shantha	Director, Agriculture Engineering & Machine Development, NERD Centre, Ekala, JaEla
Eng. T M R Dissanayake	Acting Director/ Senior Mechanical Engineer, National Institute of Post-Harvest Management, Anuradhapura

The Review Team appointed after a process of consultation with the FMRC had its first meeting at the NASTEC in Colombo where it was briefed by the Acting Director General, Eng. Ananda Namal on 30<sup>th</sup> April 2019. The Acting DG explained the objectives of the review and indicated to the Panel that the performance review should be conducted covering a period of three years (2016 – 2018). It was also indicated that the review must be conducted as per directions given in the guidelines prepared by NASTEC for the Performance Review of S & T Institutions. Self-Assessment Reports (SAR) prepared by the FMRC in respect of 2016, 2017 and 2018 were made available to the panel of reviewers. It must be stated that there is much to be desired of the reports as SARs submitted to the review panel. FMRC has failed to produce a document adhering to the format of the SAR both in terms of its content and quality.

The Team drew up an itinerary for the visit (Annexure II) it was to undertake to the FMRC at Maha Illuppallama during the period from 02 – 04 June 2019. The Deputy Director and other senior staff (all are Engineers) met the Team in the morning of 3<sup>rd</sup> June 2019. They were informed about the objectives and the purpose of the review. Deputy Director made a presentation to the Review Team regarding the FMRC based on the three reports submitted by the FMRC. He explained the evolution of the FMRC from its humble beginnings to what it is today highlighting the activities they are engaged in at present.



The Review Team members visited all sections of the FMRC located at Maha Illuppallama. They included the Research and Development, Testing and Evaluation, Agricultural and Industrial Extension, and Farm Machinery Maintaining and Repairing Sections.

The Team had discussions during the two days of stay in Maha Illuppallama with all Engineers (four in number, including three Chartered Engineers) and the Deputy Director who himself is a Chartered Mechanical Engineer. It was observed that there is no senior S&T staff other than the four Engineers and the Deputy Director. Team had a useful meeting with a wide cross section of employees of other grades including Technical Assistants who volunteered to attend the meeting. Agricultural Instructors and other support staff explained their contribution to the effective functioning of FMRC and certain difficulties encountered in the performance of their duties.



**Figure 1: Meeting with Senior Staff of FMRC on 3<sup>rd</sup> June 2019**



**Figure 2: Visit to the Testing facilities of FMRC on 4<sup>th</sup> June 2019**



**Figure 3: Meeting with Stakeholders of FMRC held on 5<sup>th</sup> July 2019 at HARTI**



A meeting with stakeholders of the FMRC was held in Colombo on 05<sup>th</sup> July at the Hector Kobbekadwa Agriculture Research and Training Institute (HARTI) which was well attended. The purpose of the meeting was to obtain feedback on the institutional support, in the presence of senior staff of FMRC. During this meeting, information on services provided by the FMRC to different categories of stakeholders such as representatives of the DOA, other Government Departments, Statutory Boards and Authorities, Provincial Departments of Agriculture (PDOA), Academics from Universities, University Colleges, Technical Colleges, representatives from JICA, Farmers, Entrepreneurs, Private sector etc. Furthermore, suggestions from different categories of stakeholders were also collected. List of those who attended the stakeholders meeting is given in Annexure III.

Team observed that FMRC has not developed a Corporate Plan. It was stated that there was never a requirement for such. It claims to prepare action plans for the projects it undertakes to engage. The Review Team observed that a Corporate Plan would enable an institution of national importance to maintain and adhere to a plan, making adjustments as required. This was an obstacle for making assessment of institutional response to external and internal environment. Thus the Team decided to seek an audience with the DGA and Chief Engineer of DOA, as it is the latter under whose purview the FMRC is functioning.

The discussion with the DGA and CEDA took place in the office of the NASTEC on 31<sup>st</sup> July 2019.

Based on the information received, a report was drafted, after series of meetings among team members where certain facts had been verified. The final report is compiled according to the guide lines provided by NASTEC.



### **3.0 MANAGEMENT ASSESSMENT**

Management assessment process carried out by the team was in consonance with the guidelines detailed in the NASTEC Review Manual and the information gathered during the review including its visit to the FMRC, discussion with the DGA and CEDOA, and the meeting with Stakeholders. Information provided in the SARs prepared by the FMRC in respect of the years 2016, 2017 and 2018 was also taken into consideration. The team worked on the assumption that the information provided in the SARs submitted by the FMRC contain authentic information.

The Management Practice Assessment requested by NASTEC in the 'Procedure for Performance Review of S & T Institutions – Review Manual' is produced in separate tables for the nine aspects of management are to be assessed is given in Annexure IV.

#### **3.1 Institutional Response to External and Internal Environment in Planning Strategy**

Any institute or organization has its own objectives aimed at improving the internal environment, thus delivering its mandated services to the external environment by allocating the available resources effectively. The Corporate Plan (or Strategic Plan) of an Institute reflects its organizational strategy to meet the needs of the external environment by adoption of policies of the Government, addressing Stakeholders demands and responding to prevailing national issues with optimum utilization of the resources available in the internal environment. It may be of relevance to record that the Review Manual prepared by NASTEC titled "Procedure for Performance Review of S & T Institutions" requires the Review Team to consider the Corporate plan and Annual plans of the institution being reviewed during the review process.

Even though the FMRC had understood the importance of having a Corporate Plan in formulating strategic future activities for a predetermined period of time, it has not developed a corporate plan which provides guidance for R&D and other planned activities to be carried out annually.

As such the review team was unable to identify the intended deliverables during the review period (2016-2018). It was further noted that even the Annual Action Plans containing the annual targets, set of actions, budgetary requirements etc., were not available within the FMRC. Further, during the discussion the team had with DGA, it was made known that there was never a requirement for a Corporate Plan, but was



working with the Annual Action Plans of the DOA. These plans were made available by the DGA to review team.

***The review team strongly believes about the necessity of having a Corporate Plan associated action plans that reflects the Government policies and Department goals in order to secure the future direction of the Institute over a period of 3 – 5 years. It further recommends that S & T staff should follow the strategic actions in selecting its R& D projects for the Annual Action Plan.***

Some important needs of Stakeholders have not been taken into consideration in certain instances in carrying out activities of FMRC on the request of the stakeholders. At the discussion with stakeholders, it was evident that a reasonable response has been shown towards the stakeholder's views and needs, but the Institute at large has not been successful in winning adequate confidence and required attraction of the stakeholders.

The above issues have not been addressed by the DOA, resulting in FMRC not securing adequate funds for their R&D and other activities.

It was observed that no frequent reviews and updates of policies and plans had been carried out at FMRC. There was also no evidence of periodic visits made to the FMRC by the higher officers of DOA.

The review team also noted that the decision-making authority of the senior staff (Deputy Director with other Engineers) of FMRC is very limited, while the involvement and inputs from the CEDA, who is empowered with direct responsibilities in managing FMRC, does not appear to be adequate. Further, a greater degree of involvement of the DGA would have been more effective, in setting directions and preparation of the Corporate Plan.

### **3.2 Planning S & T Programs and Setting Priorities**

Generally, a program represents a set of research and development projects, which are oriented towards the attainment of broader objectives of an institute. In the absence of a Corporate Plan, it is not evident that national development goals are considered in planning programs and setting priorities. However, FMRC is geared to work on program introduced by the DOA and the stakeholders. "National Food Production" Program is one such example, where the DOA has identified the need of the project, for which FMRC has contributed significantly by distributing 54 Paddy



Trans-planters in the North Western Province alone. As per information provided in the SARs, it is evident that FMRC has distributed some other farm machineries to the farmers through the National Food Production Program. Programs are planned and submitted to the Chief Engineer indicating the financial requirements for approval. A good example of such projects is where activities are identified and brought to the institute, during the meetings at provincial levels (conducted by the Provincial Council) based on the customer needs. However, the FMRC has not been given any realistic information about the availability of funds for planning programs.

There is no evidence of requests for funding to purchase equipment in planning programs at FMRC. In addition, there is no evidence in representation of stakeholders in the institution's planning and review committees. Further, it is observed that socio-economic and commercialization aspects have not been taken into account in planning programs at FMRC. However, it is not revealed to the team about such Programs which have been developed by the FMRC itself, instead of the programs introduced by DOA.

***Team recommends that FMRC gives priority for developing programs/projects on their own initiative considering the current needs of the stakeholders that reflects socio-economic and commercialization needs.***

### **3.3 Planning S & T/ R & D Projects**

FMRC is presently having a limited number of qualified technical staff comprising five Mechanical Engineers of which four are Charter Engineers. Other staff at FMRC is limited to six (06) Technical Assistants along with a pool of non-technical staff numbering fifty-four (54) employees (Details are produced in Table 01).

However, there is no evidence that the staff is provided with guidance for project planning. But it is adequately evident that previous research results/data have been used for planning projects. It is also evident that a well defined process has not been followed in preparing, reviewing and approving of projects

Since there are no organizational plans (e.g. medium-term plan, corporate plan etc.) to be used as a guidance, project selection and planning has become very ad-hoc and weak process. It is adequately evident that a few multi-disciplinary projects/ activities are being encouraged and carried out by the institution. It is also evident that certain stakeholders in the private sector are obtaining the services on offer in testing agricultural machinery and equipment.



***It is recommended that the stakeholders are encouraged to build partnerships with FMRC in promoting R & D projects/ programs.***

The team observes that there is potential for senior staff of FMRC to be involved in the preparation of Test Codes for agricultural machinery in collaboration with the Asian Pacific Network for Testing of Agricultural Machinery (ANTAM). ANTAM is an initiative led by the Centre for Sustainable Agricultural Mechanization (CSAM) of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). Evidence was produced to the Team regarding their contribution in developing some Test Codes with ANTAM. The network develops regional standards to promote the use of safe, efficient and environmentally sound agricultural machinery in the Asia programs.

Although the center has been established for research in agricultural mechanization, it was not possible to observe any research oriented program originated by the S & T personal at the institute. They have mainly provided their routine services on request of the stakeholders largely in the area of testing of agricultural machinery.

### **3.4 Project management and maintenance of quality**

With regard to the projects, it is the view of the Review Team that FMRC does not currently focus on the projects with specific time frame, methodology and objectives. This may be partly due for want of adequate funding. Still it is the responsibility of the FMRC to respond to the present day needs in the sector and to develop project proposals targeted at fulfilling those needs. For instance, FMRC should have initiated a project on “Development of cost effective and efficient mechanized weed control system”. Even though FMRC has claimed to have tested some weed control systems, they have not conducted it as a research project. The review team is inclined to believe that the project management capacity of FMRC is not satisfactory. This could be justified by the following facts.

- (i) No evidence of stakeholder meetings that have been organized to discuss the prioritized needs other than the participation at biannual meetings at the Provincial level (within Provincial Councils).
- (ii) Non availability of a specific format for presentation of a project proposal including details such as the researcher/s responsible, planned activities, intended objectives, funding requirement etc.



- (iii) Non-existence of a Research Committee at FMRC to review the project proposals and to approve such proposals
- (iv) Non-existence of an institutional research project monitoring committee headed by Head of FMRC
- (v) Non-existence of an effective project progress review committee other than the progress review meetings conducted by the DOA.

***It is recommended to establish a suitable mechanism to carry out the Project Identification, Prioritization, Project Planning, Approval, Implementation, and Continuous Progress Monitoring until the project has been completed.***

***It is also essential to establish a Research Advisory Committee at FMRC that will consider all major activities identified above. Such an Advisory Committee should comprise senior staff in the FMRC, Representative/s of DOA, selected experts drawn from Universities and Research Institutions in the country.***

***It is also recommended to encourage the S & T personal to submit the project proposals to apply for funds to obtain internal and external grants following the official channels sans bureaucratic red tape.***

### **3.5 Human Resources Management**

Human resources management involves the management of the most important asset, i.e. Human capital of the institute through implementing policies, continuing skill development programs and strategies to create an intimate employee-employer relationship and hence positive work environment at the institute. This is affected by many factors such as recruitment procedures, promotional avenues and skill development opportunities freedom to work, motivation programs, etc.

FMRC has four categories of employees namely, S & T personal, Technical staff, Administrative and Support staff. It was noted that cadre positions of S & T Personal, Technical staff and Support staff has increased marginally from 3 to 5, 10 to 14, and 62 to 71 respectively during the period under review - Table 1.

However, all S& T officers have the same academic background of mechanical engineering. For a research Centre aiming to carry out R & D on farm mechanization, multi-disciplinary approach would be more prudent and productive. The Centre may need more engineers in other fields of specializations such as mechatronic, electrical



& electronic engineering and agricultural engineering. There is a definite need to obtain the services of an Agronomist, although such expertise also may be sought from institutions functioning within DOA.

***Therefore, Team wishes to recommend adjusting the S & T cadre accordingly after a careful analysis on need basis.***

Academic qualifications of technical staff who provides technical assistance to the S & T officers are varied. They should have at least NVQ 6 level qualifications (NDT/ HNDE/NDES, OU Diploma in Technology) so that they are skilled enough in order to be recruited to the technical staff and also to be in par with the recruitment of similar categories in other government organizations.

Administrative cadre has 60 % vacancies and most of the administrative work is carried out by the Deputy Director who is also one of the few S& T officers available at FMRC. In addition, most of the administrative work is overlooked remotely by the DOA. This is not a healthy environment and may adversely affect the smooth and productive functioning of FMRC.

***It is recommended to suppress one of the Management Assistant position and create an elevated position of “Administrative Officer’ with authority to handle Human Resources and finances.***

With regard to the continuous skill development training activities, it was found that the FMRC has taken steps to train the technical staff locally.

However, evidences were not found in connection with proper systems for identification of training needs, annual human resource plan and transparent selection procedures for training at the Centre for all categories of staff. During our discussion with the DGA it was revealed that all human resource related matters come under the jurisdiction of the Additional Director General (Administration), who is physically located at Peradeniya. However, it is recommended to devise a suitable system for this purpose. According to the information provided, no S & T staff member has been given foreign training other than attending conferences/ seminars. This is equally well applying to the Technical Assistants during the period during under review.

Foreign exposure is essential and vital especially for technical staff as the R & D work should be based on the emerging technologies. This will also open a gateway to initiate international collaborations and technology transfer between the collaborating agencies in countries such as Japan, Korea, where training is provided.



Research at FMRC is hampered by the absence of S&T staff with postgraduate qualifications. Therefore, it is recommended to establish postgraduate training programs simultaneously with a promotional scheme to retain the experienced research staff at the Centre in order to assure conducting relevant and quality Research.

Review Team wishes to draw the attention of authorities to the existing conflict between the FMRC officers and the Chief Engineer. This is well evidenced by the numerous correspondences between the conflicting parties. Even though, certain steps have been taken to resolve the issue, they have not been fruitful. Therefore, the review team is in the opinion that this issue should be given the first priority to ensure that the FMRC functions effectively.

***In this context, the Team wishes to recommend the merging of FMRC with FMTC under an umbrella Institution to be headed by a Director.***

### **3.6 Management of Organizational Assets**

FMRC has Farm machinery testing laboratory, a conference hall, workshops in addition to the office spaces and administrative building. FMRC also has a few spacious official quarters for the staff. It was observed that the management maintains them well and has also been able to maintain them enhancing FMRC's physical outlook. However, except machinery testing laboratory and the conference hall, all other buildings need upgrading. It is required to improve the internal appearance that would be conducive to attract the confidence of the stakeholders. Laboratories, except the latest testing laboratory, should be improved to achieve the required laboratory infrastructure requirements (such as air conditioning, humidity and temperature controls etc.) in order to obtain accreditation as a Testing Laboratory. The review team observed the need of major repair work at the staff quarters too. The workshop of the center is in very poor condition and needs complete modernization that will bring in the state of the art technologies. Simultaneously peripheral buildings also need upgrading. It was noted that the funds allocated for the improvement of the infrastructure facilities are not adequate. FMRC being a unique institution identified for Research and Development for farming, it is recommended to develop a comprehensive project proposal to its upgrading as a Center of Excellence in farm mechanization research.

The center suffers heavily due to lack of equipment and adequate funds to maintain the existing facilities. It was noted that insufficient funds have been allocated to the



Centre even to complete the few minor repair work of the available equipment and even to purchase very essential simple tools.

### **3.7 Coordinating and Integrating the Internal Functions /Units/Activities**

Coordination of internal functions of any institute is usually achieved through deliberations at the regularly held meetings of Board of Management, Executive Officers, Divisions, General Staff, and ad-hoc meetings and discussions at different levels. However, the review team could not observe any indication of such regular meetings at the FMRC. It was reported that there are progress meetings conducted monthly at FMRC chaired by Deputy Director. It was evident that internal evaluation and restructuring of the institute have not taken place for a considerable period of time. It is observed that there exists a communication gap between the FMRC and DOA.

Organization Chart provided to the Team gave an indication as to how the different units in the FMRC are assigned with clearly defined functions. However, no evidence found on appropriate reporting procedures and feedback in management at different levels.

**Review team recommends that regular meetings are conducted at the FMRC for the purpose of coordinating, reviewing and integrating the Internal Functions. Depending on the type of meeting, in addition to the FMRC staff, invited persons from other relevant divisions/units may also participate at such meetings.**

### **3.8 Partnership in managing Information dissemination**

Technology dissemination is one of the important activities of FMRC. It has a technology transfer unit and an Agricultural & Industrial Extension section. Although they perform dissemination of information, it is not taking place according to systematic plans. The institution has linkages with key partners for sharing and dissemination of information. However, there is room for improvement in technology transfer procedures. No evidence was found in the system to obtain feedback from different types of stakeholders. In order to facilitate effective technology transfer, it is necessary to equip the FMRC with infrastructure facilities in the form of a Design Office for producing technical drawings with the use of computer appropriate



software (such as Solid Works) and for the training of persons in the manufacture and use of technologies thus developed. The institution need human resource for effective technology transfer. It is considered necessary to conduct regular Stakeholder Meetings at least once in six months. Such stakeholders must be those who engaged in design/manufacturing and importation of agricultural machineries, equipment and implements.

The review team observed that the institute has produced number of leaflets to provide technical know-how to stakeholders and the general public. It was observed that training programs are conducted for various groups of stakeholders. The institute is successfully conducting Provincial Technical Working Group (PTWG) sessions in each province.

### **3.9 Monitoring, evaluation and reporting procedure**

There is no evidence to substantiate Monitoring and Evaluation (M&E) its own activities periodically at the FMRC. Neither there is M&E Division nor Unit within the institution and also adequate Management Information System (MIS), which includes information on projects at hand. DOA organized project monitoring meeting are intended basically for monitoring the financial progress. No publications such as project reports are generated and were available for the team to peruse. However, internal newsletters and leaflets developed by FMRC were available. No evidence was found for conducting such reviews with the participation of external reviewers or stakeholders who contribute to the M&E process in the institution. The results of M&E are not used for project/ research planning and decision-making as there is no M&E process practiced in the institution. It is considered necessary to conduct regular Progress Review Meetings within FMRC and maintain records.



## **4.0 OUTPUT ASSESSMENT**

As per the documents provided by FMRC as Annual Reports for the last three years (2016-2018) and other gathered information by the Evaluation Team, it was understood that the average of ten R&D projects per year have been conducted and three projects per year on the average have been completed. But project reports and technology transfer details were not made available to the team. It was reported that test reports are delivered after testing of agricultural machinery (brought to FMRC) by private companies and individuals. It was also noted that the average time taken for testing of a particular machine or equipment was too long, it was stated that in certain cases it takes almost two years or more to complete a test.

The Output Assessment measures in different output categories as requested by NASTEC in the 'Procedure for Performance Review of S & T Institutions – Review Manual' is produced in separate tables for the eight/seven aspects of output measures are to be assessed is given in Annexure V.

### **4.1 Technologies Developed**

Number of technologies developed by any R&D Institute is one of the important factors in assessing its output performance. The quantity and the quality of those output performances would depend upon the applied inputs by the Institute. Therefore, the expected outputs related to new product/ technologies seems to be adequate when compared to inputs, but documentary proven facts are not available with FMRC as project reports and patents. Hence the productivity of the Centre cannot be measured from the given data in the Annual Reports for the period 2016 - 2018. According to the Annual Report provided for the year 2016 there are ten R&D projects that have been indicated as new technologies out of which four have been indicated as completed. Those new technologies as per the Annual Report 2016 are mentioned below.

1. Design and Develop Multi Chopper to make compost by using organic material
2. Designed and Develop Independent adjust OFC Seeder for 4w Tractor for seeding Soya, Maize Black gram, Green gram in high land field
3. Design and Develop Power Tiller attached 3 Row-Seeder for seeding Soya, Maize Black gram, Green gram in high land field
4. Design and Develop wheel mounted high capacity Finger Millet thresher to thresh finger millet capacity of 450 kg/h and easy transportation.



***Therefore, it is recommended to prepare project reports not only for the successful projects with new developed technologies but also for the completed R&D projects without expected outputs.***

***It is also recommended to apply for patents for those developed technologies that come out as innovations.***

Review team observed that the output of FMRC is mainly centred on providing Test Reports on imported and locally manufactured agricultural equipment on request though it is considered to be a time consuming activity. However, there are a few number of modified technologies developed throughout the three-year period under review.

## **4.2 Technologies transferred to industry / Entrepreneurs**

Technologies developed locally or adapted from foreign countries should be disseminated or transferred to the industry or Entrepreneurs systematically either by means of ***Technology Transfer Packages (TTP)*** or providing training for manufacturing of the particular technology/product. As per the provided information, 4 numbers of locally developed technologies are said to be transferred to industries/Entrepreneurs whereas 20 numbers of foreign technologies are also said to be adapted and transferred. But the review team was unable to verify this fact with proper documentary evidence such as TTPs or documents with manufacturing details. Therefore, the Review team has identified that FMRC is not currently following the proper systematic approach of disseminating technology to industry. The review team further noticed that the infrastructure for ***Technology Transfer Division*** within FMRC has not been created for many years.

However, the Deputy Director along with other Engineers of FMRC described to the review team about their positive contribution of some technology disseminations during the reviewing period. It was revealed that they have only provided the technical assistance for distribution of farm machinery under National Food Production Program. FMRC has provided the technical expertise in adapting suitable technology to Sri Lankan farming community under that program but not the technology dissemination.

***Therefore, the review team recommends initiating new R & D projects aiming the needs of the farm mechanization in Sri Lanka and thereby new technologies would be developed with the benefit of more technology dissemination opportunities for the industry.***



### **4.3 Information Dissemination/ Extension**

As FMRC had not been reviewed before, some institutional fundamental measures and values have not been considered as priority needs. It was noticed that FMRC has not given proper attention to prepare Training manuals, advisory leaflets maps and posters etc. as the media for dissemination of information.

Although no training manuals have been developed by the FMRC, sufficient numbers of leaflets and posters have been produced.

It was evident that FMRC has conducted nine seminars, eleven workshops and nine media events as dissemination events during the reviewing period.

### **4.4 Research Publications**

Research publications brings out the findings of research/experiments carried out systematically by a person, group or by an institute for reference and information of the others. It also reflects the quality of research and its level of achievements of the objectives. Therefore, there are few levels of research publications published by an institute depending on its capacity, nature of research and stakeholder spectrum.

With regard to FMRC, there are different levels of stakeholders ranging from agricultural engineers to ordinary farmers. Institute has a Research and development unit and provides their services for undergraduate and postgraduate level students as well. Therefore, this type of institute should have the capacity to publish papers in various Journals including SCI journals and Bulletins. Even though news letters are not categorized under research Publications, they too are a source of valuable information to make the stakeholders such as farmers and small-scale relevant industries aware of current developments.

Unfortunately, no single research paper has been published by the engineers during the period under review. However, Review Team was made to understand that existing facilities and funds are not adequate to carry out research of high quality. They have not requested direct funds from the Treasury through the Ministry of Agriculture or from research funding organizations such as NSF, NRC and CARP. Further, attention has not been paid at least to publish an article in a news bulletin. This illustrates that the staff has not paid much attention to publishing at least their normal activities, leaving aside research, to share them with the stakeholders.



FRMC being a research institute should endeavor to have some research publications to their credit. Therefore, it is recommended to investigate the barriers in order to provide required facilities and to motivate scientists to publish papers after studying/surveying prevailing problems in the industry and carrying out research for solutions for them. Introduction of an incentive scheme would be a prudent way to encourage the scientists to publish papers.

#### 4.5 Patents

Number of patents is one of the direct indicators of the outcome of a research institute such as FMRC. Review team recognized the capacity of the Engineers and their team work of the subordinate officers in providing testing of new machinery in the process of issuing quality certificates. Review Team was made to understand that the staff of the FMRC has capabilities to carry out new designs and even to suggest modifications to the machines being tested. It was claimed that some of these suggestions were accepted by the foreign manufacturers too. Therefore, there is a potential for the staff to obtain patents for the new concepts/designs to improve the machines.

However, unfortunately no single patent has been obtained by the staff during the period under review. Following reasons may have been the causes for this situation

- (i). Lack of guidance from the higher management
- (ii). Lack of encouragement and appreciation from the higher management

***Therefore, it is recommended to expose them to awareness programs on their potential and value of obtaining patents to the national development and institutional development together with personal carrier development of the individuals. Secondly, it is recommended to introduce a rewarding scheme for obtaining patents relevant to the institution's main focus, irrespective of individual's academic background or position they hold. It will be an impetus for the team to conduct more implementable innovative research in the field of mechanization. Subsequently, it will improve the image, acceptance and value of such an institute.***

#### 4.6 Services (Testing, Calibrations, Advisory etc.)

Testing & Evaluation, Agricultural & Industrial extension, Farm Machinery Maintaining & Repairing and Technology transfer units, are responsible for providing testing,



calibration and advisory services to the stakeholders. It was found that a creditable amount of work on both evaluation/technical (average more than 100/ year) and extension activities (average 40/year) had been carried out by the limited staff (four engineers). FRMC Engineers provide their expertise at nine provincial meetings conducted by the Provincial Ministries for the stakeholders of relevant areas. At the stakeholder meeting the services provided by the FRMC is reported to have been praised.

However, due to lack of the artificial cultivating lands, FMRC has to depend on the natural environment which hampers the evaluation processes. It was learnt during the visit that it takes around two years to complete performance evaluation of a 4 Wheel tractor.

Therefore, it is recommended to provide with artificial cultivation lands and adequate number of competent technical officers holding diplomas/degrees in the relevant areas to provide more effective service to the stakeholders.

It is also recommended to authorize the FMRC for Testing and Certification of Agricultural machinery through legislation. The Government must take steps to make the possession of such certification mandatory prior to importing agricultural machinery. This was highlighted by several key participants at the stakeholders meeting.

It must be the vision of the Department of Agriculture to take steps to obtain laboratory Accreditation for International Recognition of the FMRC.

## **4.7 Trainings**

Agricultural mechanization is indeed essential for modernization of agriculture. Agricultural engineering is an area where novel technologies are being introduced and practiced at a rapid pace. Hence, it is required to provide adequate training and awareness programs to disseminate technology and information to stakeholders. In addition, Training of Trainers (TOT) type training is also required to be updated with modern techniques for dissemination of knowledge of the S & T staff. However, it was evident from the SAR that the training provided to S & T staff was inadequate even though the institution has provided a few short-term training opportunities and study tours to their staff. It is required to develop a procedure and establish a Staff Development Program to identify the training needs and provide organized training to both S & T staff.



The institute conducts training programs and field demonstrations for farmers and other stakeholders based on their requests. These programs in addition to those conducted by the FMRC take the form of proposals originated by the DOA, requests from institutions and individuals.

***It is recommended that the training requirement of S&T staff of the institution as well as that of the stakeholders is assessed and the providers of such training are identified before implementation of the training program.***

#### 4.8 Others

FMRC has represented in the preparation of several ANTAM International Regional Test Codes for agricultural machinery under the sponsorship of ESCAP. The institution is the focal point for the CSAM in Asia and the Pacific. The institute represents at annual technical working group of meetings of Asian Network for testing Agricultural machinery.



## **5.0 PRODUCTIVITY OF INSTITUTION BASED ON OUTPUTS AND S & T STAFF STRENGTH**

FRMC is mainly responsible for three types of activities (i). carrying out research and development projects, (ii). providing testing services and certification and (iii). providing technical expertise for national development programs and (iv). extension services conducted by the DOA. It has only five S &T carder positions to meet these requirements. At present, there are only one Grade I (Class I) Engineer and four Engineers including one Grade III (Recruitment Level) Engineer, fulfilling all the approved carder positions of S & T level. Therefore, in –terms of the number of approved carder positions, FMRC operates at its full strength. However, none of S & T staff member has postgraduate level academic qualifications, at least master level despite some have been serving at the Centre for more than ten years. The review team strongly believes that postgraduate qualifications preferably doctorate with foreign exposure would be more effective for S & T staff in any research center/institute to carry out research and development activities efficiently and productively. The entire five S & T staff has been given only four short-term trainings and five opportunities to attend the local/foreign conferences during the three-year period under review. This shows that they have rare opportunities to upgrade their knowledge/ exposure to the latest global development which is important in identifying, designing and execution of research projects. This may be perhaps due to the equal opportunities given to the entire S& T officers attached to the DOA. It is the view of the review team that being a center established to undertake Research and Development activities, S & T staff at FMRC should be given priority on local and international training especially for postgraduate training particularly based on research in relevant fields.

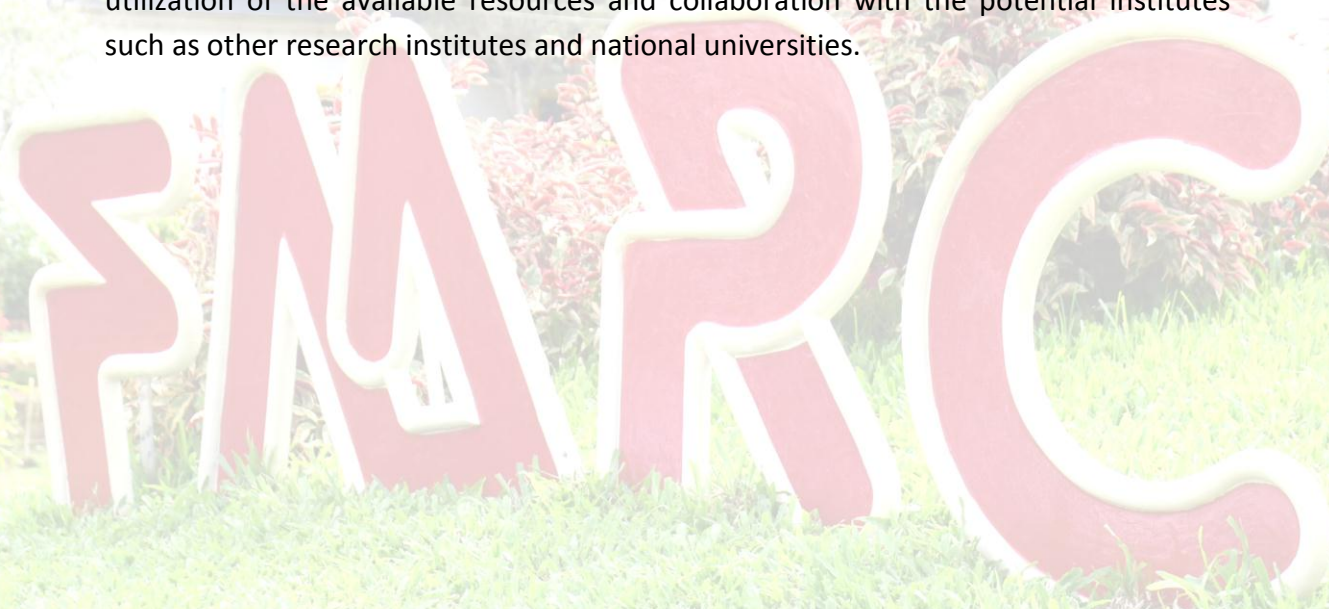
It was also noted that all the S & T staff has the same academic background of BSc. in the field of Mechanical Engineering which, is the basic recruitment qualification. There are number of S & T personnel with the background in other relevant different fields such as electrical, electronics and mechatronics. Therefore, the strength of S &T staff at FMRC is not adequate considering the number, intended functions to be attended to and capacity of the officers (in planning and execution of identified research) are considered.

It is expected from the S & T personnel to deliver novel/modified agricultural machinery according to the current needs of the local agricultural industry, new processes and knowledge dissemination in addition to providing the testing and certification services. Based on the information provided in SAR, it could be seen that the entire S & T staff involves mainly on two latter activities. None of them or the institute has either produced a breakthrough technology, a patented development,



has local/ international journal publications, conference papers, consultancy reports or done any other research base scientific communication. It should be noted that even with limited training undergone by the S & T staff, they still have some capacity to present papers at least at international conferences held in the country and also to submit research/development project proposals through appropriate channels to the government donor agencies for research (NSF/NRC) or to the National Planning Division (NPD) of Ministry of Finance. There is no evidence that single such attempt has been made for the three-year period under review.

While appreciating the numerous need based testing services attended, despite the above mentioned lapses in human resources and training, limited funds and inadequate attention of the DOA, it is the view of the review committee that productivity of the S & T personnel judged by the outcomes and the input ratio is still considered weak and should pay attention to improve the situation with maximum utilization of the available resources and collaboration with the potential institutes such as other research institutes and national universities.





## 6.0 OVERVIEW OF THE INSTITUTION'S PERFORMANCE AND CONTRIBUTION TO NATIONAL DEVELOPMENT

**Overall judgment on the different aspects based on the information collected on aspects listed under guidance for the performance review (Highlight strengths and good practices found by the reviewers in each aspect. Any weaknesses identified should also be clearly described)**

The Farm Mechanization Research Centre (FRMC) has a significant role to play in development of innovative mechanized farming systems and effective transfer of developed mechanized technologies & mechanical innovations to the clients for a sustainability of the agriculture sector of the country. It is also the only authorized government agency which holds the responsibility of issuing performance quality certificates for the modified or developed machinery by other parties (local or foreign) with recommendations of their suitability and adaptability in the local scenario taking all aspects including technical, social and economic into consideration.

Even though the Centre runs with a staff of graduate engineers with inadequate training, the services rendered by them to the stakeholders are commendable. This fact was verified and enumerated with the observations of Review Team during the period of review and it was further justified with the positive responses received from stakeholders who participated in the stakeholders' meeting. It was also observed that the team work of the entire staff which, is essential for institutional productivity, is appraisable. However, it was observed that there was no guidance, advices or any scientific approach for identifying, prioritizing and implementing the projects.

***The committee recommends appointing a team for project identification and monitoring consisting of resource personnel from universities, other relevant institutes and private sector, if the Centre is to be driven tapping its full potential in realizing its expected deliverables.***

The committee also wishes to recommend, preparing a separate Corporate Plan to the Centre with Action Plans with intended targets.

Being a research Centre intended to carry out applied research in a particular identified area, it should have its own team of qualified researchers who have reasonably long-term experience in the field in order to carry out productive research benefitting the sector. It takes a minimum of 10-15 years to reach the status of being able to carry out unsupervised/independent identifications of research areas and execution of research projects. Therefore, the DOA shall give highest priority to make



available the staff positions for postgraduate research degree (not MSc) holders and arrange postgraduate training for engineers allocating adequate share of the budget annually for it. As much as possible, such training should be arranged overseas in reputed institutions/universities. It is also recommended to make provisions for multidisciplinary research team to be recruited to the research staff of the Centre.

As evidenced by the time slot allocated for the FMRC at the progress review meetings of the DOA, poor attention given for the participation at the progress review meetings and unprofessional type of documents forwarded by some of the officers stating contradictory views (rift between the higher officers at FMRC and DOA), it is clear that FMRC operates in isolation and without adequate supervision of the DOA. It is an urgent need to provide effective remedial measures to resolve the prevailing conflicts between different segments at the management level.

It was noted that the engineers at the Centre have participated on the dissemination of technology on advice of the DOA. However, it could hardly be found proofs that the engineers at FMRC have conducted self-motivated or self-organized dissemination programs. It is worthwhile to find out the reasons and obstacles preventing them taking such initiatives.

Resource limitations, in particular, insufficient funds have seriously restricted research and technology output and also delivering efficient service especially in the last several years. Despite these constraints, the entire staff has been servicing the sector by utilizing available resources to the maximum which is commendable.

As mentioned earlier, FMRC has carried out mainly the testing services and also services to the stakeholders on request and some extension programs. However, it is regretted to note that FMRC has not capitalized as a research Centre which is again demonstrated by lacking patents, scientific publications, and research projects. Therefore, it is recommended to introduce a management system where research culture and required facilitation could be guaranteed.

Agriculture sector is one of the major sectors in the national economy contributing approximately 20 % of the Gross Domestic Production (GDP) in addition to the contribution made by the value added products, providing livelihood for a substantial section of the society and supplying food for the nation. Therefore, this sector could be considered the main sector which directly contributes to the national development. However, it is well known that agriculture sector is becoming a less profitable industry while young generation is moving away from the traditional farming systems creating a considerable labour shortage in the sector. In this scenario, appropriate farm mechanization has become compulsory for a sustainable



agricultural sector with improved total productivity in terms of cost of production, quality of the product, volume of the product, minimum post harvesting losses etc. Therefore, FMRC has a vital role in these aspects as well as a huge responsibility to develop/introduce adaptable farm mechanization systems to meet the demand for low cost processes in order to help ascending national development.

During the period under review, FRMC has given the priority and actively contributed to “National Food Production Program - NFPP” launched by the DOA. With the available human resources and financial constraints, FRMC has still been able to carry out design modifications and introduction of three types of machines namely 4W tractor coupled seeder; 4W tractor powered high capacity maize thresher, 2W tractor attached ridger for Maize to the sector in last three years which is laudable and impressive. They have also introduced many an agricultural machinery to the sector while also issuing test certificates which has been the main function of the staff at the Centre during the period under review. FRMC has contributed for national development through providing expertise for agricultural extension programs conducted by DOA and other Ministries.

When overall functions and the performance of the Centre during the past three years (2016-2018) are concerned, it could be seen that FRMC has not taken any significant attempt on their own to initiate a novel project which directly contributes to improve the farm mechanization adaptability or to introduce a breakthrough technology to the sector meeting its main objectives. Therefore, it is the view of the review team that FRMC has not been able to make a significantly meaningful contribution to the national development under the prevailing environment due to many obvious factors, some of which are out of control of either the management of FMRC or the DOA, though it has rendered some services (testing, purchasing and distribution of agricultural machinery) to the national development through some related projects/programs.



## **7.0 RECOMMENDATIONS:**

1. Develop a time bound Strategic Plan for the overall development of the institution with clear vision and mission statements, Goals, Precise objectives, Strategies to achieve the set objectives with key performance indicators (KPI) over a specified time period, preferably 5 years.
2. Development of a Master Plan for long term improvement of infrastructural facilities to meet the present and future R & D and other requirements.
3. Develop a Code of Ethics for all employees of the institute and Code of Research Ethics for scientific staff.
4. Monitoring and evaluation mechanism should be strengthened with M & E qualified staff and assign specific responsibilities to assist in decision making at managerial level.
5. Develop Guideline for Research Proposal preparation with a standard format to facilitate researchers to formulate appropriate proposals.
6. Introduce mechanism for periodic research reviews, monitoring and evaluation of research through internal/external expert committee.
7. Strengthen the Research-Extension dialog by including all stakeholders from state organizations, private industry, universities, farmer groups and NGOs and to identify and prioritize research and development long-term Research Olan and an effective feedback system.
8. Develop a procedure and establish a Staff Development Program to identify training needs of both scientific and administrative staff for career advancement, formulate training modules and identify potential training institutions.
9. Establish a human resource development program particularly focusing researched based Postgraduate training for Engineers
10. As much of the valuable information on farm mechanization generated by the FMRC has not filtered in to public domain due to lack of an effective mechanism for linking its activities with public at large.
11. Special recommendation is being made by the Performance Review Panel on the restructuring of FMRC based on the current needs.

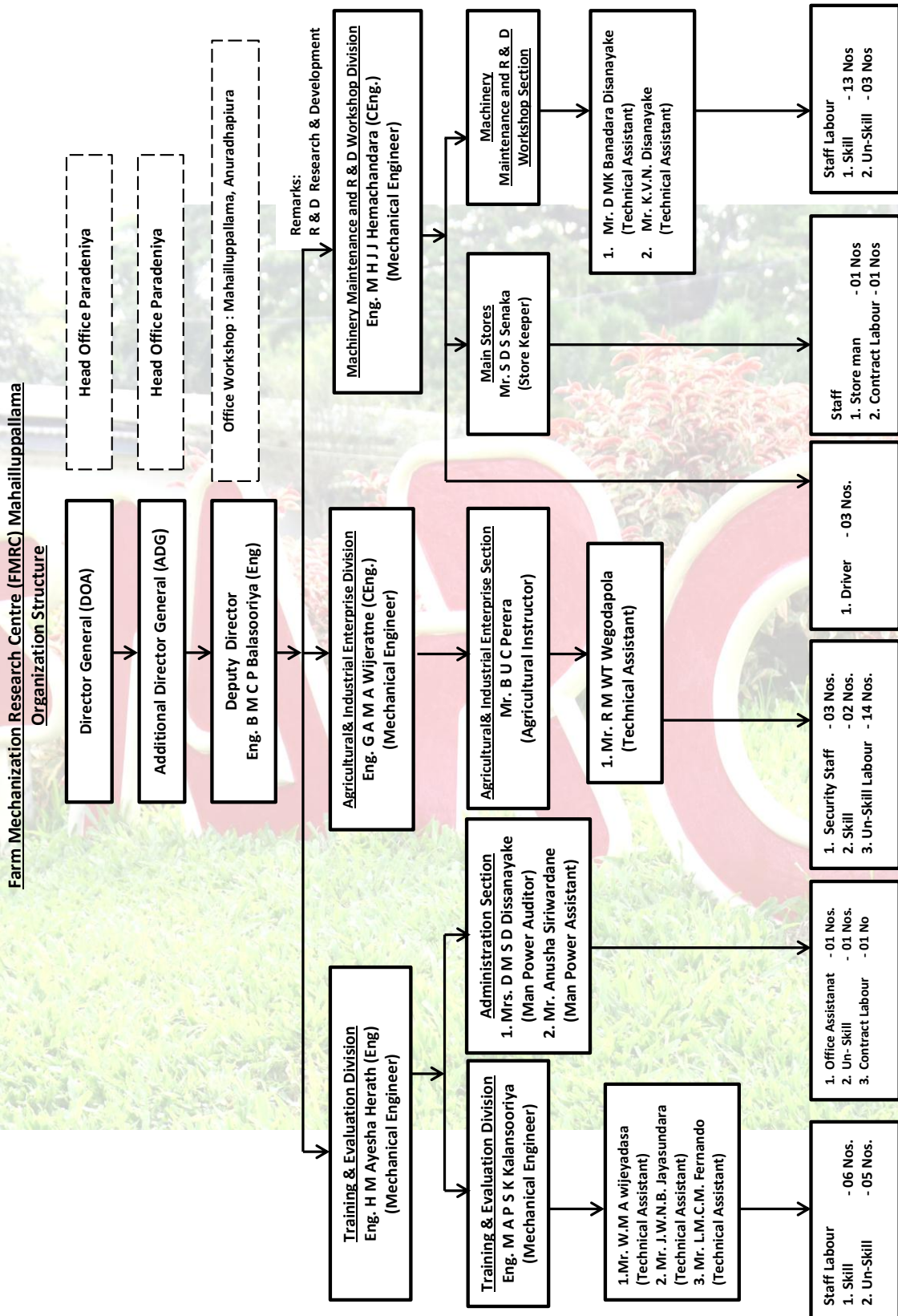


• **SUMMARY OF THE INSTITUTION'S CONTRIBUTION TOWARDS THE FOLLOWING OBJECTIVES**

Objectives	Institution's contribution
1. Promoting the use of S&T to achieve rapid economic development, improve the quality of life and alleviate poverty.	
2. Involving scientists & technologists in the formulation of policy & decision-making.	–
3. Fostering S&T to develop self-reliance and to ensure the allocation of a reasonable proportion of GNP for S& T activities.	
4. Development of Indigenous technology	
5. Importation, adaptation and assimilation of technology for rapid growth in industry, agriculture and services	
6. Production and retention of scientists, technologists and technicians of high caliber and competence.	-
7. Providing opportunities for all persons to acquire basic education in Science and its applications and inculcating the importance of science, scientific methods and technology among them.	
8. Disseminating the benefits of S&T activities to all sectors.	
9. Strengthening Science & Technology cooperation among Scientists & Technologists of Sri Lanka and those abroad to access global knowledge	
10. Capability of continuously planning, evaluating, reviewing S&T activities and identifying and promoting priority areas that are likely to be of benefit to Sri Lanka	



## Annexure I - Organization Chart – FMRC





## Annexure II - Reviewing of FMRC – Review Program

### Day 1 (03<sup>rd</sup> June 2019)

Time	Programme
8.45 a.m. – 9.15a.m.	Briefing FMRC Performance Review Process and Introduction of Review Panel by NASTEC
9.15 a.m. – 10.30 a.m.	Presentation on general overview of the institute by Act. Director, FMRC followed by Introduction of senior officials of the institute
11.00 a.m. – 11.15 a.m.	Tea break
11.15 a.m. – 12.45 p.m.	Visits by the Review Panel Visit to R & D Division and Visit to Testing & Evaluation Division (This is to be followed by a discussion with relevant Staff)
12.45 p.m. – 1.30 p.m.	Lunch
1.30 p.m. – 3.00 p.m.	Visit to Farm Machinery Maintenance & Repair Section followed by Discussion with relevant staff on Agricultural and Industrial Extension activities
3.15 p.m. – 3.30p.m.	Tea break
3.30 p.m. – 4.15 p.m.	Meeting with Non-Technical Staff and Unions
4.15 p.m. – 5.15 p.m	Observation of the 1 <sup>st</sup> day and Panel Discussion

### Day 2 (4<sup>th</sup> June 2019)

Time	Programme
9.00 a.m. - 10.30 a.m.	Visit Administration & Finance Division and meeting with staff
10.30 a.m.- 10.45 a.m.	Tea break
10.45 a.m.-12.30 p.m.	Discussion with Acting Director and selected Senior Staff to be identified during the Review
12.30 p.m. – 1.30 p.m.	Lunch
1.30 p.m. – 3.30 p.m.	Further deliberations as appropriate followed by Panel Discussion
3.00 p.m. - 3.15 p.m.	Tea break
3.15 p.m. onwards	Discussion of the Review Panel for preparation of the Review Report



**Annexure III - Particulars of Stakeholders attended to the Stakeholder Meeting  
held at the Hector Kobbekaduwa Agrarian Research and Training  
Institute**

No	Name	Institute/ Company	Designation
1	Jayaruwani Fernando	RUSL	Senior Lecturer
2	H.K Geethani Swarnalatha	Provincial dept. of Agriculture	Assistant Director
3	D L Dharmasena	Dept. of Gvt Factory	Mechanical Engineer
4	N L Hiran Peiris	Farm Service Dept. of Agriculture	Additional Director
5	K H Sampath Chaminda	Southern Provincial Council	S M O
6	K Mohotti	Kalana Engineering	
7	Kithsiri Gallage	Gallage Engineers	
8	J M K C Wickramasinghe	Heyleys Agriculture	Executive
9	K P S R Perera	Rangana motor works	D.D
10	S D S Piyathissa	University of Kuliyaipitiya	Lecturer
11	Dr. S J Arthakesari	Regional Agricultural Research and Development Center	Additional Director R&D
12	P S Kumara	Dept. of Agriculture	Deputy Director
13	W D L I Dissanayake	Dept. of Agriculture	A1
14	T Gajaba De Silva	Dave group	Head of Science
15	Kapila Wijekoon	CMC Engineering	Manager
16	Thiyagarajah	JICA	Senior Program Officer
17	Prasad Nissanka	JICA Sri Lanka Office	Project Specialist
18	Jayawardhana	Jayawardhana Engineering	Proprietor
19	Y M Gamini Kumarasiri	New Gamini	Owner
20	Uthpala Dissanayake	Harema Chemicals pvt ltd	Product Development Executive
21	C Shamedran	Mallimarketing	Manager
22	Hiranthan Chandrasena	Shaamtech pvt ltd	Senior Service Coordinator
23	Hiran Gamage	Dimo plc	Assistant Manager
24	D N A Saman Kumara	S K Engineers	
25	Janaka Wijewardhana	Janaka Builders	
26	J Abesuriya	Solex Engineering	Consultant
27	Susantha Bandara	Solex Technologies	Sales Manager
28	Manjula Mallimarachchi	RPOT	P A Scientist
29	H M J K Herath	SPMDC-DOA-MI	Deputy Director
30	N P Haritha Nimalananda	Plant Protection Service - Mahailuppallama	A D A (Development)
31	W J Samarawickrama	Central Provincial Dept. of Agriculture	A D A
32	M A D D I Roopasinghe	Seed Farm - MI	FM
33	A R P K Jayathilake	Consumer Affairs Authority	Investigation Officer



34	C N Gallage	Consumer Affairs Authority	Legal Authority
35	H M A P Herath	FMRC	Mechanical Engineer
36	W S C Hemantha	COT Anuradhapura	Lecturer
37	A Wijesinghe	Government Factory	Director
38	A M Perera	FCRDI	Director
39	B M C P Balasooriya	FMRC	Deputy Director
40	Shasanka Abeysinghe	Germania Colombo	M Executive
41	Susil Galhena	Germania Colombo	
42	Chanaka Chadrasekara	Browns	B D Manager
43	S M R Abayalal	S C S	A I
44	R H I Sanjeewani	D D A (IP) Office	A D A
45	T M L M Dissanayake	D D A (IP) Office	AI
46	Nilantha Sarath Kumara	ADA Uva provincial Dept. of Agriculture	ADA Uva
47	Rizwan	DBL	BDM
48	M R N Perera	Farmer	
49	K G C J Senadheera	Farmer	
50	Rohan Wijekoon	Ministry of Agriculture	Director (Acting)
51	C N I Dilhan	Agriculture Dept.	AI
52	Gamini Abeygunawardhana	Dept. of Agriculture	Additional Director
53	Gihan Fernando	DOMO	GM
54	Thilina Lalithantra	University of Moratuwa	Senior Lecturer
55	Prof. P L A G Alwis	Faculty of Agriculture University of Ruhuna	Prof. Agriculture Engineering
56	Udayakumara Mendis	Siyane Associate	Proprietor
57	M H M Ghouse	Atlas Metal	Proprietor
58	M S M Mansoor	Atlas Metal	Manager
59	D Sarath	Luckchandra Engineering	
60	M H M I D Bandara	Brown and Company	BDE
61	Nimal Riligala	Nimal Engineering	
62	Chinthaka Wickramarachchi	Hilearit International	



## Annexure IV - Observations & Evidences gathered during the Review Period related to Management Assessment

### 3.1. Institutional Response to external and internal environment in planning strategy

Management practice	Level of Practice (Performance Indicators) Strong/ Moderate/ Weak	Comments / Evidence
Government policies and development goals are used/ considered to establish goals and plan organizational strategy for the institution	Weak	Neither a corporate plan nor annual action plan is available. Organizational strategy of the institute is mainly based on the stakeholder requests and developments purchased from another parties
The organizational mandate (as specified by the relevant Act) is considered in strategic planning	-	No comment as a document on mandate is available
The institution is responsive to changes in Government policies and strategies	Strong	Has responded to the implementation of the programs introduced by the Government
Factors such as strengths, weaknesses, threats and opportunities are considered in strategic planning	Weak	No evidence for strategic planning at the institutional level
Stakeholders needs are taken into consideration in strategic planning	Strong	Carries out their activities on request of the stakeholders
The Board of Governors is involved in strategic planning		There is no Board of Governors
The extent to which staff members are involved in strategic planning	Weak	No evidence for involvement of staff developing the plans at departmental level
Government allocations and alternative funding opportunities (donor funding) are considered in strategic planning	Weak	Frequent requests have been made even for very small amounts of allocations (few thousands of SLR)
The extent to which policies and plans of the organization are reviewed and updated	Weak	No frequent reviews have been carried out. No evidence of regular or periodic visits made by the higher officers to the centre.



## Additional observations (if any)

Center has not been advised to develop a strategic plan. It is recommended to develop a strategic plan taking into account the Government policies and implement an action plan accordingly

### 3.2. Planning S & T Programs and Setting Priorities

A program is “an organized set of research projects, activities or experiments that are oriented towards the attainment of specific objectives”. Programs are higher in research hierarchy than projects. Program objectives should be consistent with and reflect user needs and development goals.

Management practice	Level of Practice (Performance Indicators) Strong/Moderate/Weak	Comments/ Evidence
National development goals are considered in planning programs & setting priorities		Geared to work on programs introduced by the Government
Board of Governors participate in planning and priority setting of program		No Board of Governors. Even the administrators responsible for the institute have not involved in setting up the programs
The extent to which the staff of the institution participate in programme planning and priority setting	Strong	It is apparent that staff members decide the programs and inform the higher level administrators
Stakeholder interests are considered in programme planning	Moderate	Activities are planned based on requirement identified at meetings held at provincial levels and Customer/ Stakeholder needs brought to the institute
The extent to which programmes are planned and approved through appropriate procedures	Moderate	Have submitted their financial requirements to Chief Engineer at DOA



The extent to which, the availability of funds (government allocations and other funds) generating funds are taken into consideration in planning programmes	Weak	The officers have not given any realistic figures about the funds available. Funds are provided by the DOA without any Technical Assessment
The obtaining of necessary equipment is considered in planning programmes	Moderate	Programs are not developed by the centre
Stakeholders are represented in the institution's planning and review committees.	Weak	
The extent to which socio economic and commercialization of aspects are considered in program planning.	Weak	
Effectiveness and efficiency of institutional procedures in approving new S & T programs.	Weak	No such approval procedures are clearly followed

**Additional observations (if any)**

At present, developments of S & T programs have not been conducted by the Centre. Instead, DOA introduces the projects. The others are based on the requirements identified at Provincial Level.

*With regard to (1) and (2) above it is needed to verify from the DG and CEO*

Generally, a program represents a set of research and development projects, which are oriented towards the attainment of broader objectives of an institute. In the absence of a Corporate Plan, it is not evident that national development goals are considered in planning programs and setting priorities. However, FMRC is geared to work on programme introduced by the DOA and the stakeholders. "National Food Production" Program is one example, where the DOA has identified the need of the project, for which FMRC has contributed significantly by distributing 54 Paddy Trans-planters in the North Western Province. It is apparent that the FMRC decides the programs and request the DOA for approval for implementation. A good example of such projects is where activities are identified and brought to the institute, during the meetings at provincial levels based on the customer needs.

Programmes are planned and submitted to the Chief Engineer indicating the financial requirements for approval. However, the FMRC has not been given any realistic information about the availability of funds for planning programs.



There is no evidence of requests for funding to purchase equipment in planning programs at FMRC. In addition, there is no evidence in representation of stakeholders in the institution's planning and review committees. Further, it is noticed that socio-economic and commercialization aspects have not been taken into account in planning programs at FMRC. However, it is not revealed to the Team about such Programs which have been developed by the FMRC itself, instead of the programs introduced by DOA.

*Team recommends that FMRC gives priority for developing programs/projects on their own initiative considering the current needs of the stakeholders that reflects socio-economic and commercialization needs*

### 3.3 Planning S & T/ R & D Projects

A project is a set of activities designed to achieve specific objectives within a specified period of time. A project includes interrelated research activities or experiments, schedule of activities to be completed within a specific time period, budget, inputs and outputs, focused towards intended beneficiaries. Projects are the building blocks of programs. For an institution to achieve its objectives, it is necessary for projects to be well planned in terms of their expected outputs, activities, and input requirements.

Management practice	Level of Practice (Performance Indicators) Strong/Moderate/Weak	Comments/ Evidence
The staff is provided with guidance for project planning	Weak	No evidence is available
Previous research results/data are used for planning projects	Strong	Adequate evidence produced
The extent to which the institution follows a formal process for preparation, review and approval of projects	Moderate	Well defined process was not available.
The extent to which organizational plans (e.g. medium-term plan, corporate plan, strategy etc.) are used to guide project selection and planning	Weak	No such guidance is available
Multidisciplinary projects/ activities are encouraged by the institutions	Moderate	Evidence of such multi-disciplinary projects is available
Foreign collaborations are encouraged and incorporated in planning.	Moderate	Evidence for foreign collaboration was cited



Partnership with private sector is encouraged by the institution	Strong	Many stakeholders in the private sector are working closely
The extent to which development research/activities are considered in planning projects	Moderate	Main area of activity is confined to development research
The extent to which basic research are considered when planning projects	Weak	No basic research is being considered. It is not expected from the institute
The degree to which adverse effects on environment are considered in planning projects	Moderate	Environmental protection is indirectly ensured by mechanization

Additional observations (if any)  
Planning S & T projects should be formalized

FMRC is presently having a limited number of qualified technical staff comprising five Mechanical Engineers of which four are Charter Engineers. Other staff at FMRC is limited to 6 Technical Assistants along with a pool of non-technical staff numbering 54 employees (Details are produced in 2.0 Organizational Structure and Staff of FMRC above).

However, there is no evidence that the staff is provided with guidance for project planning. But it is adequately evident that previous research results/data have been used for planning projects. It is also evident that a well defined process has not been followed in preparing, reviewing and approving of projects

Since there are no organizational plans (e.g. medium-term plan, corporate plan etc.) to be used as a guidance, project selection and planning has become very ad hoc and weak process. It is adequately evident that a few Multi-disciplinary projects/ activities are being encouraged and carried out by the institution. It is also evident that certain stakeholders in the private sector are obtaining the services on offer in testing agricultural machinery and equipment. *These stakeholders may be encouraged to build partnerships with FMRC in promoting R & D projects/ programmes.*

The team observes that there is potential for senior staff of FMRC be to be involved in the preparation of Test Codes for agricultural machinery in collaboration with the Asian Pacific Network for Testing of Agricultural machinery (ANTAM). ANTAM is an initiative led by the Centre for Sustainable Agricultural Mechanization (CSAM) of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). Evidence was produced to the Team regarding their contribution in developing some Test Codes with ANTAM. The network develops regional standards to promote the use of safe, efficient



and environmentally sound agricultural machinery in the Asia programs except the testing services conducted by them are originated with the instructions of the DOA. Although the center has been established for research in agricultural mechanization, it was not possible to observe any program originated by the S & T personal at the institute. They have mainly provided their routine services on request of the stakeholders.

With regard to the projects, it is the view of the Review Team that FRMC does not currently focus on the projects with specific time frame, methodology and objectives. This may be partly due for want of adequate funding. Still it is the responsibility of the FRMC to respond to the present day needs in the sector and to develop project proposals targeted at fulfilling those needs. For instance, FRMC should have initiated a project on “development of cost effective and efficient mechanized weed control system”. Even though they have tested some such weed control systems, they have not conducted as a research project (with results) and concluded the project. Thus the observation of the Review Team is that the project management of the Centre is not satisfactory. This could be justified by the following facts.

- (i). No evidence of stakeholder meetings that have been organized to discuss the prioritized needs other than the participation at biannual meetings at the Provincial level (within Provincial Councils).
- (ii). Non availability of a specific format for presentation of a project proposal including details such as the researcher/s responsible, planned activities, intended objectives, funding requirement etc.
- (iii). Non-existence of a research committee at DOA level to review the project proposals and to approve such proposals
- (iv). Non-existence of an institutional research project monitoring committee headed by Head of FMRC
- (v). Non-existence of an effective project progress review committee other than the progress review meetings conducted by the DOA, where adequate attention is not given.

*Therefore, it is recommended to establish a suitable mechanism to carry out the Project Identification, Prioritization, Project Planning, Approval, Implementation, and Continuous Progress Monitoring until the project has been completed.*

*It is also essential to establish a Research Advisory Committee at FMRC that will consider all major activities identified above. Such an Advisory Committee should*



comprise Senior staff in the FMRC, Representative/s of DOA, selected experts drawn from Universities and Research Institutions in the country.

It is also recommended to encourage the S & T personal to submit the project proposals to apply for funds to obtain internal and external grants following the official channels sans bureaucratic red tape.

### 3.4 Project management and maintenance of quality

Proper project management and quality assurance/improvement practices are needed to ensure effective research operations, the quality of output and achievement of desired objectives.

Management Practice	Level of Practice (Performance Indicators) Strong/Moderate/Weak	Comments/ Evidence
The effectiveness of the procedures for resource allocation at different levels (organization, departments, program etc.)	Weak	FMRC is devoid in resource allocation as it is handled by the DOA
Ensuring that instruments, equipment and infrastructure facilities are sufficient for implementation of projects	Moderate	Enough funds have not been allocated by DOA
The effectiveness of administrative procedures and support for project implementation (procurement and distribution of equipment and materials, transport arrangements, etc.)	Weak	Staff for implementation of Administrative / Financial procedures are not available within the FMRC
Formal monitoring and review processes are used to direct projects towards achievement of objectives	Weak	Absence of actions plans for monitoring and review
The extent to which the researchers are supported by the required technical / field staff.	Weak	Due to acute shortage of technical support staff
Ensuring that established field / lab methods, and appropriate protocols are used	Moderate	
Research projects/ S& T activities are completed within the planned time frame.	Weak	No evidence was produced
Ensuring that scientists / researchers have access to adequate scientific information (scientific journals, internet, international databases, advanced research institutes, universities etc.) that strengthens the quality of research.	Moderate	To be discussed and clarified



The extent to which quality assurance practices are followed by the institutions	Moderate	To be discussed and clarified
Ensuring that researchers/ scientists have access to computers and necessary software	Moderate	To be discussed and clarified

Additional observations (if any)

A proper management system should be introduced

### 3.5 Human Resources Management

Availability of an adequate number of qualified staff and effective management of human resources are key determinants of organizational performance. Establishing a cadre of qualified staff takes many years. To keep pace with new developments in science, technology, and management, it is also essential to upgrade staff regularly. Staff planning, selection, recruitment, evaluation, and training are key components of human resources management that need to be in place for effective performance of an institution.

Management Practice	Level of Practice (Performance Indicators) Strong/Moderate/Weak	Comments/ Evidence
The institution maintains and updates staff information in a database (including bio data, disciplines, experience, publications, projects)		Beyond the scope of FMRC. However, it is considered essential to maintain records of attendance, leave etc. within the FMRC
The institution, plans and updates its staff recruitments based on program and project needs		Beyond the scope of FMRC
The effectiveness of the selection procedures and the schemes of recruitment		Beyond the scope of FMRC
Training is based on institution and program objectives and on merit,		Beyond the scope of FMRC
The effectiveness of the procedures in promoting a good working environment and maintaining high staff morale.	Moderate	Beyond the scope of FMRC as it is handled by the DOA
The effectiveness of staff performance appraisals	Moderate	



The effectiveness of rewards and incentive schemes in motivating the staff	Weak	No evidence is produced
The effectiveness of managing staff turnover, absenteeism and work interruptions.	Strong	Industrial peace and pleasant working environment are evident .

Additional observations (if any)
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Human resources management involves the management of the most important asset, i.e. human capital of the institute through implementing policies, continuing skill development programs and strategies to create an intimate employee-employer relationship and hence positive work environment at the institute. This is affected by many factors such as recruitment procedures, promotional avenues and skill development opportunities freedom to work, motivation programs, etc.

FMRC has four categories of employees namely, S & T personal, Technical staff, Administrative and Support staff. It was noted that cadre positions of S & T Personal, Technical staff and Support staff has increased marginally from 3 to 5, 10 to 14, and 62 to 71 respectively during the period under review.

However, all S& T officers have the same academic background of mechanical engineering. For a research Centre aiming to carry out R & D on farm mechanization, multi-disciplinary approach would be more prudent and productive. The Centre may need more engineers in other fields of specializations such as mechatronic, electrical & electronic engineering and agricultural engineering. There is a definite need to obtain the services of an Agronomist, although such expertise also may be sought from institutions functioning within DOA. Therefore, Team wishes to recommend to adjust the S & T cadre accordingly after a careful analysis on need basis.

Academic qualifications of technical staff who provides technical assistance to the S & T officers are varied. They should have at least NVQ 6 level qualifications (NDT/ HNDE/NDES, OU Diploma in Technology) so that they are skilled enough in order to be recruited to the technical staff and also to be in par with the recruitment of similar categories in other government organizations.

Administrative cadre has 60 % vacancies and most of the administrative work is carried out by the Deputy Director who is also one of the few S& T officers available at FMRC. In addition, most of the administrative work is overlooked remotely by the DOA. This is not a healthy environment and may adversely affect the smooth and productive functioning of FMRC.



*Therefore, it is recommended to suppress one of the Management Assistant position and create a position of “Administrative Officer” with authority to handle Human Resources and finances.*

With regard to the continuous skill development training activities, it was found that the FMRC has taken steps to train the technical staff locally.

However, evidence was not found as regards proper systems for identification of training needs, annual human resource plan and transparent selection procedures for training at the Centre for all categories of staff. During our discussion with the DG/DOA it was revealed that all HR related matters come under the jurisdiction of the Additional Director General (Administration) physical located at Gannoruwa. However, it is recommended to devise a suitable system for this purpose. According to the information provided, no S & T staff member has been given foreign training other than attending conferences/seminars. This is equally well applying to the Technical Assistants during the period during under review.

Foreign exposure is essential and vital especially for technical staff as the R & D work should be based on the emerging technologies. This will also open a gateway to initiate international collaborations and technology transfer between the collaborating agencies in countries such as Japan, Korea, where training is provided.

Research at FMRC is hampered by the absence of S&T staff with postgraduate qualifications. Therefore, it is recommended to establish postgraduate training programs simultaneously with a promotional scheme to retain the experienced research staff at the Centre in order to assure conducting relevant and quality Research.

Review Team wishes to draw the attention of authorities to the existing conflict between the FMRC officers and the Chief Engineer. This is well evidenced by the numerous correspondences between the conflicting parties. Even though, certain steps have been taken to resolve the issue, they have not been fruitful. Therefore, the review team is in the opinion that this issue should be given the first priority to ensure that the FMRC functions effectively.

In this context the Team wishes to recommend the merging of FMRC with FMTC under an umbrella Institution to be headed by a Director.



### 3.6 Management of Organizational Assets

Organizational assets include not only staff buildings, equipment, and finances, but also include assets such as knowledge, technologies developed, intellectual property, and even credibility and reputation. A continuous effort is needed to protect all of these assets, because they are the basis for the sustainability of the institution and allow it to continue delivering quality research and service outputs.

Management Practice	Level of Practice (Performance Indicators) Strong/Moderate/Weak	Comments/Evidence
The ability of the institution to carry out its mandate and the assigned statutory powers		To be clarified with DOA
Infrastructure (buildings, stations, fields, roads) is satisfactorily maintained.	Strong	Infrastructure is well maintained
Vehicles and equipment (lab, field, office) are properly managed and maintained.	Moderate	Management and maintenance are done by FMRC
The effectiveness of procedures to ensure that equipment are in working order	Moderate	Management and maintenance are done by FMRC
The effectiveness of the institution's overall strategy in generation and proper utilization of funds	Strong	Above 99 % allocated funds have been utilized
The extent to which the institution identifies opportunities for income generation and cost recovery	Weak	Due to absence of regulatory framework. However, requirement for acquiring FRMC certification will encourage local production/importation more acceptable for the promotion of quality agricultural machinery and equipment
The extent to which the intellectual property rights of the institute are protected	Weak	Protecting IPR does not arise in the absence of patents by FMRC/individuals

Additional observations (if any)

Attention of the administration in the Ministry of agriculture should be drawn in this aspects



FMRC has Farm machinery testing laboratory, a conference hall, workshops in addition to the office spaces and administrative building. FMRC also has a few spacious official quarters for the staff. It was observed that the management maintains them well and has also been able to maintain them enhancing FMRC's physical outlook. However, except machinery testing laboratory and conference hall, all other buildings need upgrading. It is required to improve the internal appearance that would attract the confidence of the stakeholders. Laboratories, except the latest testing laboratory, should be improved to achieve the required laboratory infrastructure requirements such as (air conditioning, humidity and temperature controls etc.) in order to obtain accreditation as Testing Laboratory. The review team observed the need of major repair work at the staff quarters too. The workshop of the center is in very poor condition and needs complete modernization that will bring in the state of the art technologies. Simultaneously peripheral buildings also need upgrading. It was noted that the funds allocated for the improvement of the infrastructure facilities are not adequate. FMRC being a unique institution identified for Research and Development for farming, it is recommended to develop a comprehensive project proposal to its upgrading as a Center of Excellence in farm mechanization research.

The center suffers heavily due to lack of equipment and adequate funds to maintain the existing facilities. It was noted that insufficient funds have been allocated to the Centre even to complete the few minor repair work of the available equipment.

### 3.7 Coordinating and Integrating the Internal Functions /Units/Activities

The planning and coordination of units (departments, divisions, committees, research stations, etc.) and interaction among them are often neglected and it affects the overall performance of the institution. The organization of these units and the overall structure need to be reviewed from time to time to ensure smooth and efficient operations. The planning and coordination of units, logistics, resources, and information flows are necessary to achieve integration and smooth functioning.

Management Practice	Level of Practice (Performance indicators) Strong /Moderate/Weak	Comments/ Evidence
The extent to which institution is evaluated internally and restructured based on current needs	Weak	Internal evaluation and restructuring have not taken place for a considerable period of time.*
The effectiveness of internal communication and coordination mechanisms	Moderate	



Institution's overall direction and coordination are provided by a central planning committee / unit.	Weak	No such committee exists.*
The extent to which different units are assigned clearly defined functions	Strong	Evidence were produced by view of "Organization Structure"
Responsibilities of research / management staff are clearly identified	<b>Moderate</b>	
Effectiveness of using appropriate reporting procedures and feedback in management at different levels	Weak	No evidence

## Additional observations (if any)

\*Special recommendation is being made by the Performance Review Panel on the restructuring of FMRC based on current needs.

Coordination of internal functions of any institute is usually achieved through deliberations at the regularly held meetings of Board of Management, Executive Officers, Divisions, General Staff, and ad-hoc meetings and discussions at different levels. However, the review team could not observe any indication of such regular meetings at the FMRC. It was reported that there are progress meetings conducted monthly at FMRC chaired by Deputy Director. It was evident that internal evaluation and restructuring of the institute have not taken place for a considerable period of time. It is observed that there exists a communication gap between the FMRC and DOA.

Evidence of which different units are assigned with clearly defined functions was produced by view of "Organization Structure chart". Responsibilities of research / management staff are clearly identified. No evidence was found on appropriate reporting procedures and feedback in management at different levels. In the management structure, there are divisions which do not have legally assigned duties and responsibilities required for the said post. As there is no separate admin and finance unit, engineers have to overlook this work too.

*Review team recommends that regular meetings are conducted at the FMRC for the purpose of coordinating reviewing and integrating the Internal Functions. Depending on the type of meeting in addition to the internal representatives, persons invited from other relevant divisions/units may also participate at such meetings.*

However, it will be necessary to draw up the Terms of Reference for such Committees. The institute needs to have a clear vision, mission, goals and strategies. It is required to educate the staff regarding where we are now and where we need to go and how to go. It is important to organize regular meetings



with the stakeholders of the institute to get their observations, comments and suggestions towards the activities of the institute.

### 3.8 Partnership in managing Information dissemination

An important requirement of all S& T / Research & Development institutions is management of dissemination of technology and information to users. The partnership / linking up with other actors in Science & Technology and information system (including, universities, industries, private sector, international research organizations, extension, farmers etc.) promotes information exchange, collaboration, and cost sharing, and ultimately improves the quality and relevance of research.

Management Practice	Level of Practice (Performance Indicators) Strong/Moderate/Weak	Comments/ Evidence
The institution systematically plans and performs dissemination of information	Moderate	Perform dissemination of information without systematic plans
The extent to which the institution plans and maintains linkages with key partners for sharing and dissemination of information	Moderate	There is room for improvement
The effectiveness of institutional procedures for technology transfer	Moderate	There is room for improvement
The effectiveness of the system to obtain feedback from different types of stakeholders	Weak	No such evidence

Technology dissemination is one of the major activities of FMRC. It has a technology transfer unit and agricultural& industrial extension section. Although they perform dissemination of information, it not taking place according to systematic plans. The institution has linkages with key partners for sharing and dissemination of information. However, there is room for improvement in technology transfer procedures. No evidence was found on the system to obtain feedback from different types of stakeholders. In order to facilitate effective technology transfer, it is necessary to equip the FMRC with infrastructure facilities in the form of a Design Office for producing technical drawings with the use of computer software (such as Solid Works) and for the training of persons in the manufacture and use of technologies thus developed. The institution needs human resource for effective technology transfer. It is considered necessary to conduct regular Stakeholder Meetings at least once in six months. Such



stakeholders must be those who engaged in design/manufacturing and importation of agricultural machineries, equipment and implements.

The review team observed that the institute has produced a large number of leaflets to provide technical know-how to stakeholders and the general public. It was observed that training programs are conducted for various groups of stakeholders. The institute is successfully conducting Provincial Technical Working Group (PTWG) sessions in each province.

### 3.9 Monitoring, evaluation and reporting procedure

Monitoring (assessing ongoing S&T / research activities) and evaluation (evaluating the value, quality and results of research) are key management processes of Public-S&T institutions. Monitoring and evaluation are also important for determining whether the institution is learning from its earlier achievements and failures. Monitoring, evaluation, and reporting procedures need to be properly designed (i.e. integrated into project planning and implementation) and periodically reviewed, in order to provide useful information for decision-making and accountability.

Management Practice	Level of Practice (Performance Indicators) Strong/Moderate/Weak	Comments/ Evidence
The institution monitors and evaluates (M&E) its own activities periodically	Weak	No evidence
M&E is supported by an adequate management information system (MIS), which includes information on projects (e.g. costs, staff, progress, and Results).	Weak	No evidence
The extent to which S& T results and other outputs are adequately reported internally (e.g. through reports, internal program reviews, seminars).	Moderate	No such publications like project reports, internal newsletters were found
External stakeholders contribute to the M & E process in the institution	Weak	No evidence for conducting such reviews with the participation of external reviewers
The extent to which the results of M&E are used for project/ research planning and decision-making.	Weak	No evidence at all

Additional observations (if any)
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