



# National Agricultural Mechanization Policy 2020

Ministry of Agriculture  
Government of the People's Republic of Bangladesh

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# National Agricultural Mechanization Policy 2020

## 1.0 Introduction

- 1.1 Agricultural mechanization is the science-based system of using more machinery and technology to reduce the use of human and animal energy in agricultural production, storage and processing in a more efficient and labor & time-saving ways. Mechanization saves materials, time, labour and money. At the same time, it increases the efficiency of crop cultivation, cropping intensity and productivity and raises the crop quality which leads to profitable agriculture and creates employment opportunity. Besides, the use of machinery ensures the security of agricultural production in adverse environments.
- 1.2 Introduction of mechanization in Bangladesh was initiated officially through the supply of machinery among the farmers. In the early 1950s, mechanized cultivation is started and agricultural machinery is introduced at the farmer level through the distribution of tractors, power pumps and sprayers with government initiatives. In 1970, due to the widespread loss of livestock for the devastating cyclone in the coastal areas, a limited number of tractor and power tiller is distributed for cultivation in the affected areas. Under the instruction of Bangabandhu Sheikh Mujibur Rahman, the father of the nation in newly independent Bangladesh in 1973, to increase crop production in possible minimum time, 40 thousand power operated low lift pumps, 2 thousand 9 hundred deep tube wells and 3 thousand shallow tube wells are installed like the first time at a nominal price subsidy. This was a historic step for the extension of modern agricultural machinery.
- 1.3 In 1988, a prolonged flood all over the country incurred an extensive loss to the crops and livestock. For this, the tariff is exempted from the imported agricultural machinery, relaxed to testing requirements of imported machinery and encouraged importers in the private sector instead of single way imports of the public sector. As a result, the private importers started importing small engines and power tillers extensively which makes the process of agricultural mechanization in the country dynamic.
- 1.4 In the existing agricultural system, on one hand, there is an acute shortage of labour, on the other hand, for laborious and risky work, slightly educated children of the farmers do not get the same encouragement as before for conventional manual labour dependent agricultural work. As a result, ordinary educated young people of the villages are not showing interested in agriculture as was before. It is possible to make these young people more interested in agriculture through agricultural mechanization. For this, besides the leading role of the government, public and private banking sector need to take initiative to provide financial assistance.
- 1.5 Agricultural mechanization is playing an important role in the gradual transition from traditional subsistence agriculture to commercial agriculture. It is now a demand of

the time for the expansion of agricultural mechanization in the advancement of commercial agriculture. Already a considerable number of machinery repairing workshops or service centers have been built in rural areas. In the country now land cultivation, irrigation, threshing and spraying of pesticides are all done with the help of machines. However, seedling planting, sowing, fertilizer application, crop harvesting, threshing, sorting, etc. have not yet been fully accomplished with the help of machinery, although the use of machinery per hectare has increased at a significant rate due to favorable policy support. In this case, there is further opportunity to increase energy and efficiency. As a result of the supply and availability of machinery, the interest of farmers towards agricultural machinery is increasing which needs to be continued and made more dynamic.

- 1.6 In this policy, only crop production management related things have been incorporated, value-added product processing and irrigation related things have not been taken into consideration.

## **2.0 Agricultural Mechanization Policy: Vision, Mission and Objectives**

### **2.1 Vision**

- 2.1.1 Transition to efficient, profitable and commercial agriculture through agricultural mechanization and ensuring sustainable food and nutrition security.

### **2.2 Mission**

- 2.2.1 Encourage the introduction of farmer-friendly agricultural machinery according to the socio-economic status of the farmers, small size of the farm and fragmented land and soil type of the farmers.
- 2.2.2 Keeping in view the diverse agro-environment and climate change, agricultural work and profession are to be more efficient, risk-free and easy.
- 2.2.3 Accelerating agricultural mechanization for the profitable, commercial and sustainable agricultural production system.

### **2.3 Objectives**

- (1) To expedite the use of cost-effective and profitable agricultural machinery at the farmer level.
- (2) To increase productivity by increasing the skills of agricultural labour.
- (3) To increase the use of mechanical, electrical and renewable energy in the land for increasing the crop yield.
- (4) To increase cropping intensity for increasing overall crop production.
- (5) To strengthen research and development activities on agricultural machinery.
- (6) To encourage local agricultural machinery manufacturers to survive in a competitive market system by assisting.

- (7) To expedite the process of agricultural mechanization by providing easy and specialized loan facilities to importers, manufacturers, rental machinery service providers and farmers.
- (8) To declare the quality of agricultural machinery and spare parts supplied by the local agricultural machinery manufacturers and importers and to ensure the opportunity to set standards from specialized institutions.
- (9) To strengthen mechanization for horticultural crops in addition to field crops.
- (10) To strengthen the agricultural machinery services, training, diversified uses and repair maintenance system.

### **3.0 Challenges of Agricultural Mechanization**

#### **3.1 Small Farms and Fragmented Lands**

In Bangladesh, the average farm size is small and the lands are fragmented. As a result, the use of machinery for tilling, sowing, planting, cutting, etc. in the fragmented lands is quite difficult and expensive. Even it is not possible to ensure full capacity utilization of small and medium agricultural machinery.

#### **3.2 Limited Purchasing Power of Farmers and Small Entrepreneurs in Purchasing Agricultural Machinery**

Due to the price hike of metallic raw materials throughout the world, the price of agricultural machinery is growing up. The ability of small and medium farmers and most of the small scale entrepreneurs have to procure and maintain expensive agricultural machinery (viz., rice transplanter, seeder, harvester and thresher) at their own expense is limited and obtaining loans at the local level is not easy. As a result, despite having the interest of farmers in purchasing modern agricultural machinery, it does not become possible to do so.

#### **3.3 Inadequate After-Sales Service of Agricultural Machinery**

There is an acute shortage of qualified service providers (viz., mechanic and workshop) and spare parts in the remote areas of the country. As a result, the repair and maintenance of agricultural machinery during the crop season become uncertain, farmers and small entrepreneurs suffered. Though some of the importers and suppliers of agricultural machinery provide after-sales services, it is insufficient compared to demand. Moreover, the machinery being seasonally used, remains left idle during the rest of the year, as a result, increases maintenance costs.

#### **3.4 Limitations of Agricultural Extension Services in Agricultural Mechanization**

Agricultural mechanization activities being important for modern agriculture, the trained manpower at the institutional level has not been adequately developed to impart machine based technological knowledge and skills at the farmer's level.

### **3.5 Lack of Modern Capital Equipment and Skilled Manpower for Local Production of Agricultural Machinery and Spare Parts**

Over the past few decades, older capital equipment has been used in locally developed small and medium-sized agricultural machinery and spare parts manufacturing factories and lacks the technical skills of the subject-based manpower (operators, technicians, mechanics, etc.). Even their training opportunities are limited. As a result, the production of quality machinery and spare parts are hampered.

### **3.6 Absence of Quality Declaration and Determining System of Imported and Locally Produced Agricultural Machinery**

At present, there is no system for the declaration and determining the quality of imported and locally produced agricultural machinery. As a result, in many cases, farmers and small entrepreneurs are facing losses and discouraged for purchasing and using inferior quality agricultural machinery.

### **3.7 Lack of Suitable Rural Infrastructure for Use of Modern Agricultural Machinery**

In all regions, suitable road facilities and farm roads are inadequate for agricultural machinery movement in the field level.

### **3.8 Adverse Effects of Natural Disasters**

Due to the effects of global climate change, natural disasters such as sea-level rise and increasing salinity, cyclones, tidal surges, flash floods and droughts are increasing. Crops are often damaged, especially in haors and southern regions. In these regions, the availability of agricultural machinery and their use are comparatively very difficult.

### **3.9 Variation in Load Bearing Capacity of Area-Based Soil**

Due to differences in area-based soil type, the agricultural machinery cannot be used equally in all regions.

## **4.0 Favorable Environment for Agricultural Mechanization**

4.1 Under the farm mechanization programme of the Department of Agricultural Extension, efforts have been made for the extension of farm machinery developed by the research institutes. This has created enormous interest among the farmers about agricultural machinery use in their fields.

4.2 The government, non-government and development associated organizations have taken initiatives to form local service providers' groups for extension of agricultural machinery. Through this group formation of small agricultural machinery entrepreneurs, the services of machinery are increasing in crop production at minimum cost. As a result, agricultural productivity is increasing in the country and both the farmers and the service providers are being benefited.

- 4.3 Even in remote areas of the country, local repair factories have been set up for the repair and maintenance of agricultural machinery, which has created a user-friendly environment for modern agricultural machinery. Already the local production and marketing of agricultural machinery and spare parts have been improved substantially.
- 4.4 Several non-government organizations have come forward to provide import, marketing and after-sales services of agricultural machinery and spare parts.
- 4.5 The government is providing development assistance to popularize and extend the use of agricultural machinery.
- 4.6 The Ministry of Agriculture has already taken steps to formulate and implement the Agricultural Mechanization Roadmap 2021, 2031 and 2041 and has formulated the National Agriculture Policy 2018.

## **5.0 Principles Followed in Formulating Policy**

In formulating this policy, the principles of prioritizing the welfare of agriculture and farmers, especially small and marginal farmers and farmers' cooperatives, sustainable environment, competitive market, introduction of safe and quality agricultural system and maintaining equity among all stakeholders have been followed.

## **6.0 Agricultural Mechanization Strategy**

### **6.1 Popularization and Extension of Agricultural Machinery**

#### **6.1.1 Selection of Appropriate Agricultural Machinery and Marketing**

Considering the purchasing capacity of farmers, farmers' cooperatives, service providers' entrepreneurs and the farm size, steps will be taken to supply qualitative, sustainable and suitable machinery. Besides, encouragement will be given to make appropriate machinery easily available in adverse situations (clay soil and lodging of plants etc.). In such circumstances, agricultural extension related organizations will continue their efforts to arrange field demonstrations and popularization activities of local and imported modern machinery.

#### **6.1.2 Extension of Agricultural Machinery Supply and Use through Government Incentives**

The existing incentive activities regarding the supply and extension of agricultural machinery use will be continued and in particular cases, it will be increased.

In providing government incentives, the following strategies will be followed.

- Initially, this incentive will be provided for a fixed period among the farmers and farmers' groups/farmers' cooperatives for familiarity and popularization of agricultural machinery. The incentive must apply to standardized/certified

agricultural machinery. Emphasis will be given on short term useable essential machinery during the year.

- The demand for agricultural machinery will be increased by coordinating the supply and demand of machinery without harming the private sector and incentive rates and management will be restructured in line with the increase in supply to the private sector.
- The incentive system will be more transparent and rely on information technology to ensure supply among suitable farmers, farmers' cooperatives and agricultural machinery service providers.
- Coordination at the Upazila level will be strengthened in providing incentives.

### **6.1.3 Providing Loans for Purchasing Agricultural Machinery**

To encourage farmers and agricultural machinery service providers, easy access to agricultural loans will be ensured for purchasing agricultural machinery from government, commercial, NGOs and financial institutions. Minimum interest or special interest-free loans will be provided to farmers/service providers for purchase of agricultural implements used for a short period in a year related to sowing, planting, cutting, drying, storage and processing. In this case, the government can pay interest to the concerned bank as a government subsidy.

Besides, necessary assistance will be provided to the farmers or farmer's groups/ farmer cooperative organizations so that they can purchase agricultural machinery by paying the price in installments with a down payment.

### **6.1.4 Fixation of Tariffs for Marketing of Imported and Locally Manufactured Agricultural Machinery**

- A healthy competitive system will be maintained in the marketing of imported and locally manufactured agricultural machinery.
- At present the amount of duty levied on import of various parts / raw materials for production of various agricultural machinery, such as power tillers, power threshers, power reapers and power seeder is 1% and is exempted from all regulatory duties, supplementary duty and value-added tax. But it does not include transplanters and combine harvesters. In the future, the tariff rate will be further reduced or fixed at a reasonable level for importing raw materials or spare parts for domestic production of all types of agricultural machinery.
- All types of sprayers and power tillers used in agriculture have been exempted from the total value-added tax (excluding advance tax) levied at the import and production stage. The list will also include transplanters and combine harvesters, with keeping the policy at the running stage. Besides, sales duty on all agricultural machinery and other duties will be fixed at a reasonable level.

- Reasonable incentives will be given, where necessary, to expand the protection and servicing facilities of all machinery that have the potentials to be produced in the country.

#### **6.1.5 Ensuring Technical Support for Extension of Agricultural Machinery at All Levels**

To increase the awareness, training, information and services of farmers/farmer cooperatives and small scale entrepreneurs in agricultural machinery for extension and implementation of agricultural mechanization, initiatives will be taken to establish separate manpower structure with agricultural engineering knowledge i.e. Agricultural Mechanization Wing to increase the institutional capacity of the Department of Agricultural Extension from the upazila to all higher levels and other organizations.

Efficient repair services will be encouraged including making spare parts easily available at the field level

#### **6.2 Skill Development and Creation of Agricultural Machinery Service Provider Entrepreneur**

- 6.2.1 The rental use of agricultural machinery is playing a significant role in agricultural mechanization. Farmers are getting the opportunity to use agricultural machinery on a rental basis without investing in the purchase of agricultural machinery privately. To increase agricultural machinery services, creation of service provider entrepreneurship and motivation programs will be introduced. Training will be provided on maximum use of agricultural machinery, operation, repair, maintenance and business management.
- 6.2.2 Motivation and necessary support will be provided to agricultural machinery services providing entrepreneurs, manufacturers, importers, dealers, mechanics and farmers/farmer cooperative organizers.
- 6.2.3 In order to provide agricultural machinery services, government and private rental machinery service and establishment of mechanic service centers will be encouraged to establish at the local level.
- 6.2.4 Practical training will be provided on agricultural mechanization at the grassroots level of the Department of Agricultural Extension including other agencies and for manpower working in agricultural machinery manufacturing factories.
- 6.2.5 Training will be provided to increase the capacity of small agricultural machinery service providers, farmers and farmers' cooperatives, mechanics and repair workers. At the same time, the opportunities will be increased for providing expert training to researchers, extension workers and other concerned people.

6.2.6 In case of rent of agricultural machinery, the share of dividend due from the crop produced will be fixed at a reasonable rate among the renter, the farmer and the landowner.

### **6.3 Maximum Power Utilization of the Agricultural Machinery through Consolidation of Cultivable Land and Introducing Integrated Crop production System**

It is not possible to achieve maximum efficiency from the machinery used in agricultural production due to the small size and fragmentation of cultivable land in the country. The integrated crop production system will be introduced by organizing farmers at the local level to ensure maximum utilization of agricultural machinery services in rental system. In this case, the crop production system will be encouraged on land lease and contract basis keeping in view the interests of small and marginal farmers. In this regard, detailed procedure will be determined later.

### **6.4 Research and Development**

Research and development are essential for the innovation and assimilation of suitable agricultural machinery in different regions and crops. The following steps will be taken to encourage the government and non-government research, education and local agricultural machinery manufacturing organizations for the design and development of agricultural machinery at farm level by locations.

6.4.1 Basic and applied research will be encouraged for the innovation and development of modern and appropriate agricultural machinery for different regions and crops.

6.4.2 Higher training and facilities will be increased to develop research capacity.

6.4.3 Different research institutes and universities conduct research individually in the innovation of agricultural machinery; in many cases, the same device is being developed by different organizations. In such case, this type of research will be encouraged to be conducted in an integrated approach. Local machinery manufacturing organizations will be involved in the research work.

6.4.4 Initiatives will be taken to develop and extend appropriate machines and technology for the production, harvest, storage and transportation of horticultural crops as well as field crops.

6.4.5 The patenting of research innovations will be encouraged.

6.4.6 Cooperation among research organizations, agricultural machinery manufacturing industries and marketing entrepreneurs will be strengthened for the innovation and development of agricultural machinery. Concerned industrial entrepreneurs will be encouraged to invest in the research sector.

6.4.7 Integrated initiatives will be taken for quality research development, quality setting and training of agricultural machinery.

- 6.4.8 Agricultural machinery research will include issues related to machinery management and operator's health risks.
- 6.4.9 Cooperative activities on agricultural mechanization will be encouraged in technology transfer with developing and developed countries.
- 6.4.10 Initiatives will be taken to offer a degree in diploma of agricultural engineering under Agricultural Training Institute (ATI), Polytechnic Institute (PTI), Vocational Training Institute (VTI), technical schools and colleges.
- 6.4.11 Initiatives will be taken to devise, introduce and use of modern agricultural machinery/methods for proper application of chemical fertilizer, insecticide and pesticide, and irrigation water.
- 6.4.12 Reliable database on the information of agricultural machinery will be formed for agricultural machinery research and policy decisions.
- 6.4.13 Integrated program will be taken to extend the research findings of agricultural machinery at the field level.

## **6.5 Expansion of Agricultural Machinery Manufacturing Industry**

The following steps will be taken to expand and improve the quality of agricultural machinery and spare parts production at the local level.

- 6.5.1 Initiatives will be taken to consider the agricultural machinery manufacturing industry as an agro-based industry.
- 6.5.2 Incentive import tax will be imposed at reasonable rates on capital equipment of agricultural machinery and spare parts manufacturing industry.
- 6.5.3 Import duty rebate facility on parts used in agricultural machinery manufacturing and assembly industry will be continued. In the interest of the smooth development of this industry, the number of components of the tax-exempt inventory will be expanded as required on the basis of specific proposals.
- 6.5.4 The agricultural machinery manufacturing industry has been considered as a high priority sector in industrial policy. In the interest of the development of this industry, concessional facilities will be provided to the industrial entrepreneurs manufacturing agricultural machinery as per their requirement. As there is a statutory duty on imported raw materials in the agricultural machinery manufacturing industry, the issue of VAT rebate will be considered for the sale and supply of agricultural machinery and spare parts. The import duty on imported agricultural machinery will be fixed at a reasonable level considering the production cost of locally produced agricultural machinery and protection of the interests of the entrepreneurs.
- 6.5.5 Agricultural machinery assembling industries will be encouraged in the country. In this case, the domestic and foreign joint investment will be encouraged. The use of a portion of locally produced parts in the assembling industry will be ensured.

- 6.5.6 There will be opportunities to import high-value agricultural machinery such as combine harvesters, rice transplanters, etc. as well as refurbished agricultural machinery. However, the standard quality of these equipment has to be declared by the refurbished authority and the importer.
- 6.5.7 "Agricultural Machinery Manufacturers Zone" will be established in the agricultural machinery and spare parts manufacturing industrial zones. In the development of this industry, the establishment of 'higher service centers' in government and private initiatives in specialized manufacturing organizations will be encouraged.
- 6.5.8 Initiatives will be taken for agricultural machinery manufacturing industries to procure raw materials (various types of steel) at affordable prices from steel manufacturing companies.

## **7.0. Precision Agriculture**

The practice of precision agriculture will play an important role in the future mechanization of the use of information technology-based materials to increase crop productivity through maintaining soil health. The following steps will be taken for the expansion of various materials and measuring instruments related to precision agriculture.

- 7.1 Measures will be taken to reduce import tariffs on auxiliary equipment used in precision agriculture.
- 7.2 Precision agriculture related technologies and techniques will be included for the training at government and private levels.

## **8.0 Use of Renewable Energy**

The government has taken the plan to meet 10 percent of the country's total energy demand by 2020 and 50 percent by 2050 from renewable energy sources (solar, biogas, wind, etc.). The following steps will be taken to achieve this goal.

- 8.1 The use of solar pump irrigation for crop production will be encouraged.
- 8.2 The use of solar driers for drying vegetables and fruits will be encouraged.
- 8.3 The use of the 'solar system' for the processing of agricultural products at the farm level will be encouraged.
- 8.4 Possibilities of growing high-value profitable crops in 'greenhouse' using 'solar system' will be encouraged.
- 8.5 Production and use of bio-fertilizer and biogas from agricultural and industrial wastes will be encouraged.
- 8.6 Combined use of solar and biogas energy will be encouraged to generate electricity i.e., building up of mini-grid at farm/ community levels.

## **9.0 Conservation Agriculture**

Conservation farming methods can be used to maintain fertility and moisture content of the soil, saving cost and time crop production, reduce greenhouse gas emissions and increase cropping intensity. The following steps will be taken for this purpose.

- 9.1 Depending on crop and soil, after harvesting of crops, steps will be taken to encourage and popularize the practice of mixing crop residues with the soil using zero or minimum tillage to the farmers.
- 9.2 For the expansion of conservation agriculture, training and encouragement will be provided to the farmers and agricultural machinery service providers for proper use of related agricultural machinery and technology.
- 9.3 To protect the agro-environment, appropriate agricultural machinery development and improvement activities will be undertaken for the management of crop residues after harvesting.
- 9.4 Programmes will be taken for the development and extension of conservation agricultural technology to increase soil organic matter and prevent soil erosion.
- 9.5 Financial incentives, credit flow and development assistance will be provided to increase the use of machinery related to conservation agriculture.
- 9.6 The extension of water-saving technologies and the use of digitalized methods for measuring water will be encouraged.

## **10.0 Special Region Based Mechanization**

### **10.1 Haor Area**

There is a risk of crop damage due to flash floods, floods, hailstorms and lightning. The following steps will be taken for rapid agricultural mechanization in the Haor area to reduce the crop growing period and timely harvesting and cultivation.

- 10.1.1 Government development assistance will be provided at a higher rate for the rapid extension of seeders, transplanters, reapers, threshers and driers machines.
- 10.1.2 For the convenience of farmers, service infrastructure will be established for threshing, winnowing, drying and in storage processing.
- 10.1.3 Proper communication system will be developed for easy transportation of machinery and agricultural commodity.
- 10.1.4 Measures will be taken to create machinery service entrepreneurs by giving priority to the haor area.

## **10.2 Coastal and Char Areas**

Agriculture in these regions is at high risk due to cyclone, tidal wave, salinity of soil & water, and submergence. The following measures will be taken for the proper selection of machinery and extension according to the cropping pattern of these areas.

- 10.2.1 Measures will be taken for the development and extension of suitable machinery as per the characteristics of the area.
- 10.2.2 Development assistance or incentives will be provided at an increased rate in these areas in need of increasing machinery supply.
- 10.2.3 Initiatives to form a large farm by integrating small fragmented lands will be encouraged. In this case, loan facility, consultation and incentives will be provided at a minimum rate.
- 10.2.4 Use of appropriate machinery will be encouraged for mungbean, sesame, sunflower, maize, soybean, watermelon, etc. in the char and coastal regions.
- 10.2.5 Due to the inaccessibility of this area, emphasis will be given to construct roads suitable for the movement of agricultural machinery required for conducting agricultural work.

## **10.3 Hilly and Barind areas**

Due to the differences in the nature of the soil and the source of irrigation water, there is a lot of variation in cultivation practices but still, there are a lot of possibilities. Considering these, the following steps will be taken.

- 10.3.1 Initiatives will be taken to innovate, develop and expand suitable agricultural machinery for suitable crops considering soil fertility, undulating land and availability of irrigation water in the area.
- 10.3.2 The use of solar energy, biogas, etc. as necessary energy required for conducting agricultural activities in remote areas will be encouraged.
- 10.3.3 The farmers will be encouraged to use appropriate irrigation equipment and water-saving technologies (drip irrigation, sprinkler irrigation, etc.) to ensure maximum use of surface water for crop production in these areas.
- 10.3.4 Emphasis will be given to conserve rainwater and use it for irrigation through appropriate technology.
- 10.3.5 Hilly areas, being inaccessible, emphasis will be given to construct suitable roads for the movement of necessary machinery for agricultural activities.
- 10.3.6 Service infrastructure for threshing, winnowing, drying, storage and processing of crops will be established for the benefit of economically backward hill farmers.
- 10.3.7 Increased development assistance or incentives will be provided to increase the supply of machinery in hilly and remote areas.

- 10.3.8 Loan facilities at a minimum rate, advice and incentives will be provided to encourage the initiatives for horticultural crops and large-scale farming.
- 10.3.9 Irrigation will be applied in different horticultural crops and lands ensuring surface water use by gravity flow constructing dam on chara/ springs/ creeks in remote areas.

## **11.0 Quality Testing and Certification**

The use of quality machinery is one of the criteria for achieving optimum lifespan and efficiency of used agricultural machinery. It is important for all machine manufacturers, traders and users to have access to standardized machinery. Although the system of standardization and certification of consumer goods, construction materials, etc. are prevailing in Bangladesh, there is no such opportunity in the field of agricultural machinery at present. The following policies will be taken to create a quality assessment infrastructure and certification system to ensure the proliferation of quality machinery in the country.

- 11.1 Assistance will be provided to build the necessary infrastructure and make equipment easily available for the standardization of agricultural machinery and to create skilled manpower.
- 11.2 Government service provider organization will provide quality assessment services according to the needs of agricultural machinery manufacturers, importers and users. Besides, standard testing measures will be taken by research and educational institutions by increasing lab facilities. In this case, necessary initiatives will be taken to formulate necessary laws, rules and procedures for standardization and certification.
- 11.3 Publicity and awareness-raising measures will be taken to all stakeholders for raising awareness among the machinery manufacturer, supplier and user-level about the necessity, advantages and benefits of standardization.

## **12.0 Coordination and Collaboration**

Effective coordination among the stakeholders is essential for identification, preparation, expansion, integration, synchronous and cooperative farming practices, loans, tariffs/ tax incentives, etc. to facilitate and carry out activities on time. To develop this system following steps will be taken.

- 12.1 Initiatives will be taken for effective coordination between research and manufacturing institutes on the invention of agricultural machinery, fabrication of prototypes, identification of faults at field level and its modification, etc.
- 12.2 A favorable environment will be created for coordination, cooperation and information exchange among machinery related researchers, manufacturers, extension workers, farmers and farmers' cooperatives, service providers, farmers and mechanics.

- 12.3 Inter-ministerial coordination will be increased in the establishment of agricultural machinery manufacturing industry, machinery import, tariff/ tax imposed on marketing and loan disbursement.
- 12.4 Coordination between the Ministry of Agriculture and the Road Transport Authority will have to enhance the movement and use of heavy agricultural machinery on roads for service delivery.

### **13.0 Participation of Youth**

Educated rural youth need to be build up as machine service entrepreneurs and ensure greater participation of the youth community in machinery repair and maintenance. In this case, the following policy will be taken.

- 13.1 Youth community will be encouraged to set up area-based servicing workshop and machinery service centers to ensure after-sales service, repair and maintenance services.
- 13.2 Preference will be given to the technically educated jobless youths with the assistance of incentives, training, advice and bank loan to develop them as machinery service entrepreneurs.

### **14.0 Participation of Women**

The participation of women in the operation of agricultural machinery is increasing. The following steps will be taken to increase the participation of women in agricultural mechanization.

- 14.1 Women will be encouraged through training about awareness building and safe machinery use.
- 14.2 Women will be encouraged to become entrepreneurs in providing agricultural machinery services.

### **15.0 Safe Management**

Accidents often occur due to infrastructural limitations in the movement of agricultural machinery, unskilled machinery operation and careless contact with moving parts. For the safety management of agricultural machinery/equipment, the following steps will be taken.

- 15.1 All agricultural machinery used in crop production will be encouraged to be manufactured for easy operation, especially for women-friendly and safe.
- 15.2 Encouragement will be given to ensure the supply of necessary safety equipment during the sale of machinery.
- 15.3 Publicity and training will be provided on the safe management of the machinery.

## **16.0 Investment**

Agricultural machinery manufacturing industries, machinery repair and maintenance factories, hired machinery service providers, farmers group and individual level farmers will be encouraged to invest in the agricultural mechanization sector. Income tax rebates on profits earned from the agro-machinery manufacturing industry will be provided at reasonable rates.

## **17.0 Bank Loan**

In the case of agricultural mechanization, there is capital insufficiency in farmers, machinery service providers and local agricultural machinery manufacturer level. To increase such investment and capital flow, the following steps will be taken.

- 17.1 Loan disbursement at a minimum rate will be introduced for agricultural machinery manufacturers under government specialized loan schemes for the purchase of capital machinery.
- 17.2 Initiatives will be taken to allocate a certain portion of the total loan of the agricultural sector for the purchase of agricultural machinery under agricultural mechanization activities.

## **18.0 Policy Implementation through Work Plan Formulation, Monitoring and Coordination**

A work plan will be needed to formulate by the Ministry of Agriculture for the implementation of the policy after its approval. Then initiatives will be taken for proper implementation of the formulated policies and action plans by preparing the framework for coordination and monitoring of the implementation process.

## **19.0 Conclusion**

The future agriculture is being transformed into machinery based commercial agriculture in terms of creating diversified jobs for rural workers and shifting them to more lucrative occupations. It is possible to achieve the desired success by taking timely steps in this way of sustainable mechanization. In such case, this policy of the government will play a vital role. In this context, it will be possible to achieve the desired goal of agricultural mechanization through the adoption and proper implementation of public-private integrated activities in light of the formulated agricultural mechanization policy.