

***Country Report  
Cambodia***

**Agricultural Mechanization and Agricultural  
Development  
Strategies in Cambodia**

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**By**

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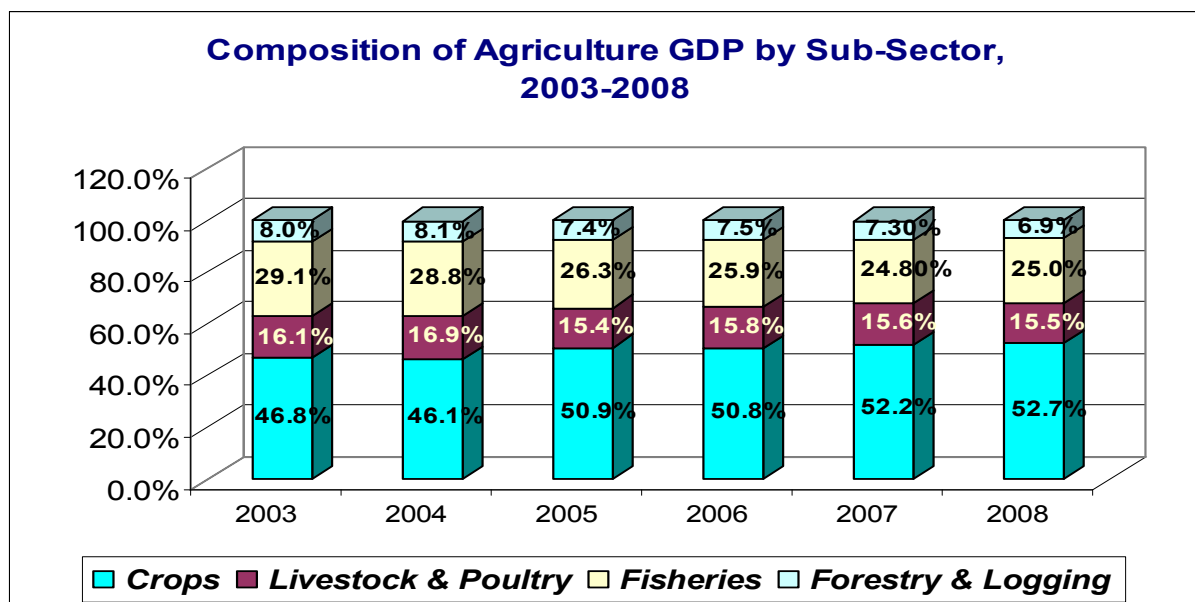
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## INTRODUCTION

The Cambodia has population nearly 14 million depends on agriculture (mainly rice), followed by livestock, fisheries, and forestry. Agriculture remains the mainstay of the Cambodia economy, employing about 80 percent of labor force. During first mandate the Government of Cambodia changed, the main focus of national institutions, particularly economic institutions in compliance with the free market economic performance. Agriculture became the main sector of the economy: 46.1% of the GDP in 1993, 33.5% of the GDP in 2002, 30.0% of the GDP in 2007 and 34.4% of the GDP in 2008. It also plays an important role in ensuring food security.

In the context of a free market economy, the Ministry of agriculture, Forestry and Fisheries had transformed the subsidy and production policies to servicing policies. Technical, extension, supply and intervention services were provided to farmers, who comprise about 85 percent of the population.

### Composition of Sub-Sectors, 2003-2008

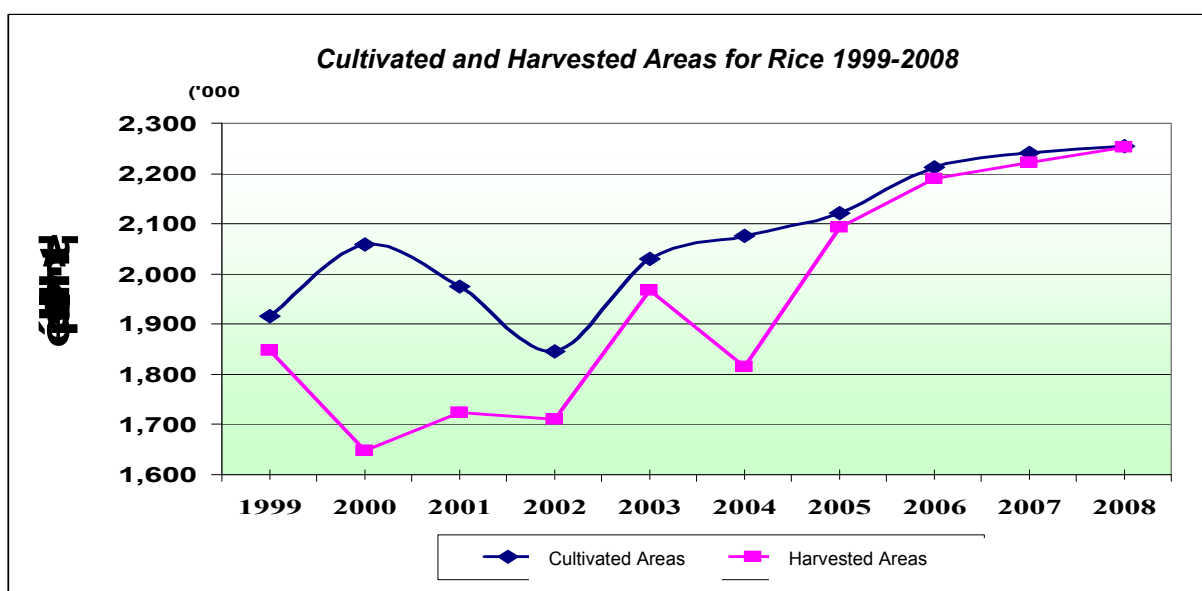


The above graph shown that the crop production is highly increasing and the crop composition contributed to about 46.1% in 2004, 50.9% in 2005, slightly decreased to 50.8% in 2006, 52.2% in 2007 and 52.7% in 2008. The fisheries composition in agriculture is decreased from 28.8% in 2004 to 24.8% in 2007 and this is probably due to several affects and it is increasing up to 25% in 2008. The trend of the share (%) for forestry and logging activity in agriculture is reduced down if compared to 2004 until the present, down from 8.1% in 2004 to 6.9% in 2008. For livestock production, the composition is slightly changed if compared during the last five years.

## 1 Five-Years Evolution of Agricultural Production

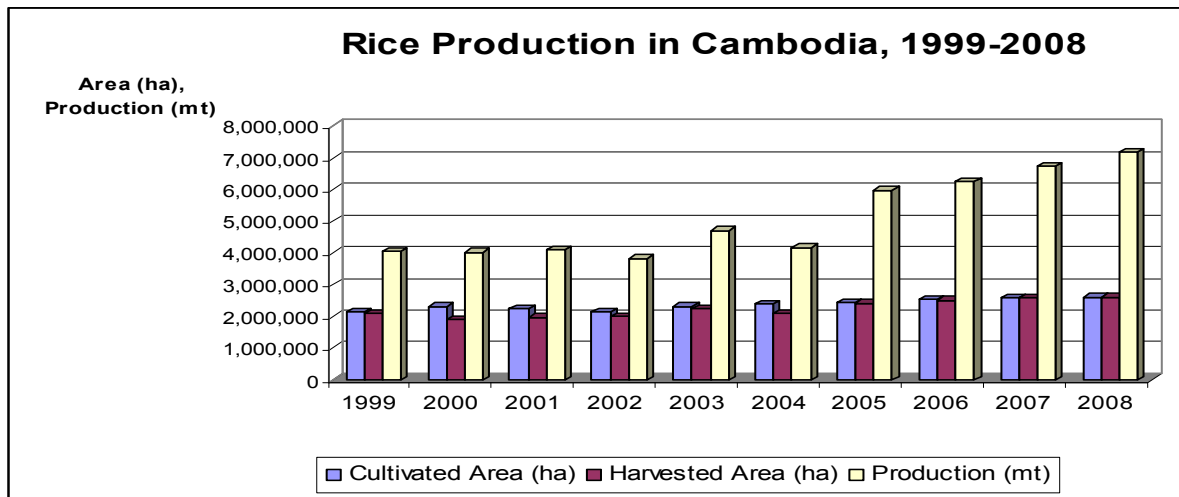
### 1.1 Rice Production

Description	2004	2005	2006	2007	2008	Change 2008/2007 (%)
Cultivated Areas (ha)	2,374,175	2,443,530	2,541,433	2,585,905	2,610,064	0.93
Harvested Areas (ha)	2,109,050	2,414,455	2,516,415	2,566,952	2,613,363	1.81
Rice Yield (t/ha)	1.977	2.479	2.489	2.621	2.746	4.69
Production (mt)	4,170,284	5,986,179	6,264,123	6,727,127	7,175,473	6.66
<b>Rice Surplus (mt)</b>	<b>416,118</b>	<b>1,319,571</b>	<b>1,433,880</b>	<b>1,649,640</b>	<b>2,025,033</b>	<b>22.76</b>
<b>Paddy Surplus (mt)</b>	<b>650,184</b>	<b>2,061,830</b>	<b>2,240,438</b>	<b>2,577,562</b>	<b>3,164,114</b>	



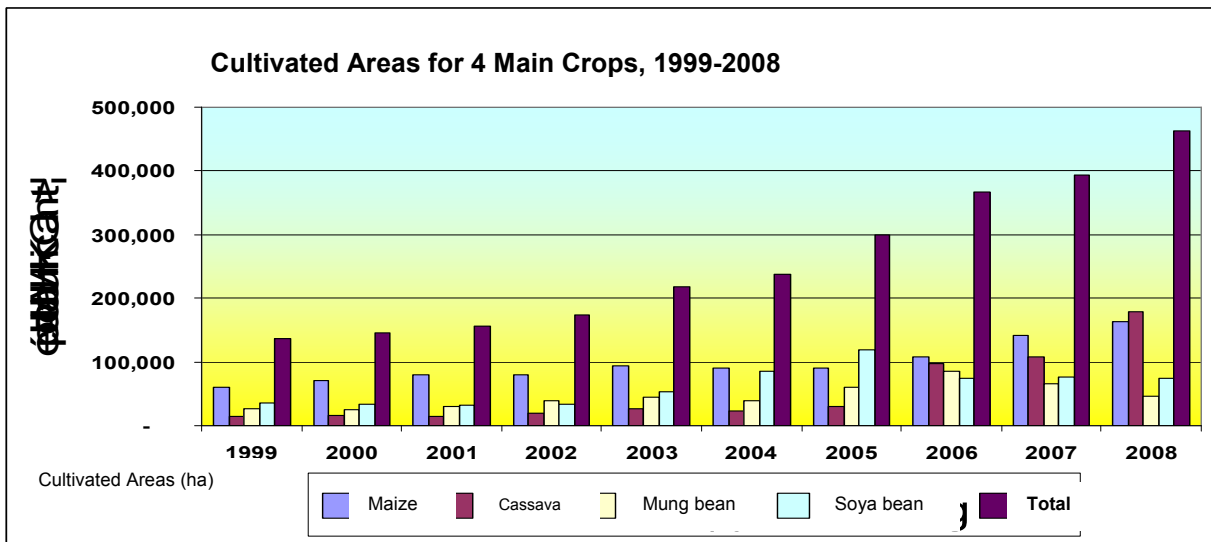
The total cultivated area for rice production in Cambodia is considerably expanded during the last 10 year, from 1999 to 2008, except the year 2002 the cultivated area was decreasing due to the affects of climate condition, especially flood and drought. However, this area was recovered and increased from 2,374,175 ha in 2004 to 2,615,741 ha in 2008 (increase of around 241,566 ha during last 5 year, 2004-2008).

The wet rice production is highly contributed about 80% of the total rice production. Cambodia has been affected by natural calamities such as insufficiency of water resulted from the droughts in mid season of some areas, the problems of insect destruction and flooding occurrences in some production areas. Because of these problems, the production is normally changed in accordance with the natural condition (especially, floods and droughts).



During the last 10 year period, 1999-2008, it is observed that the total rice production in the country (wet and dry season rice) increased from 4.17 million tons of paddy in 1999 to about 7.17 million tons in 2008, except the worse climate condition occurred in 2002 and 2004 affected rice production dropped. For 2008, the rice production is produced higher than 2007 (increase of 6.6% or 448,346 tons of paddy) which is being as a results of better climate condition, farm management, changing the farming techniques of the farmers, especially the application of new & high-yielding rice seed variety. The rice surplus is estimated around 2 million tons (3 million tons in paddy) in 2008 and this is considered as a historical production which Cambodia never reached before.

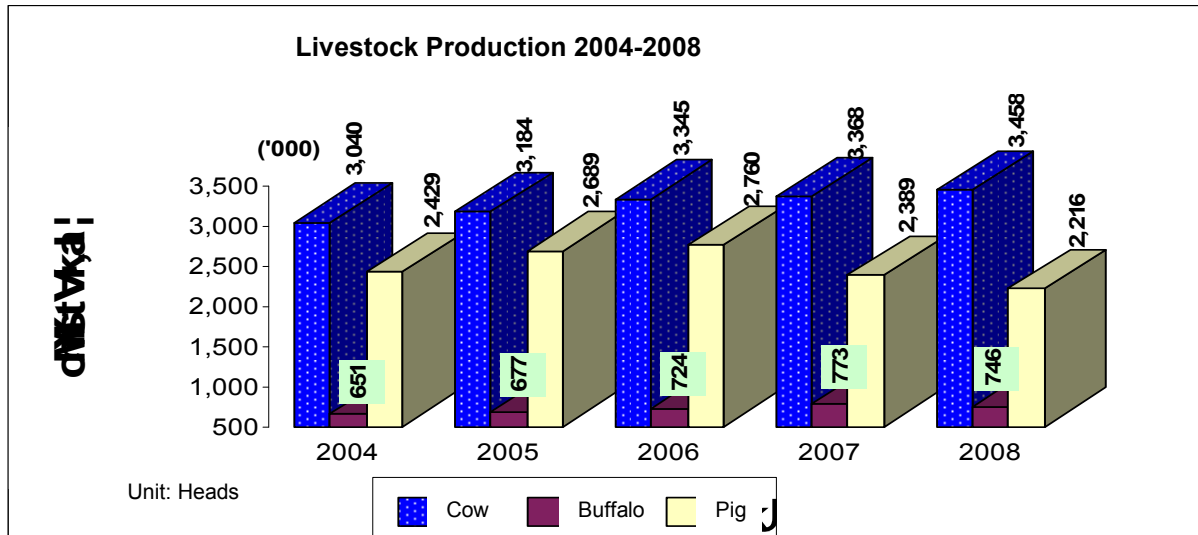
## 1.2 Four Main Crop Production



The cultivated areas for subsidiary and industrial crops are fluctuated in according to the market demand. In general, the production of subsidiary and industrial crops is yearly increased and the permanent crop production is also shown increasing. It is noted that cassava and maize production is highly increased due to the demand of local use and export as raw materials for processing industries,

especially to the neighboring countries. (Detail figures for subsidiary and industrial crop production is shown in Annex).

### 1.3 Livestock Production

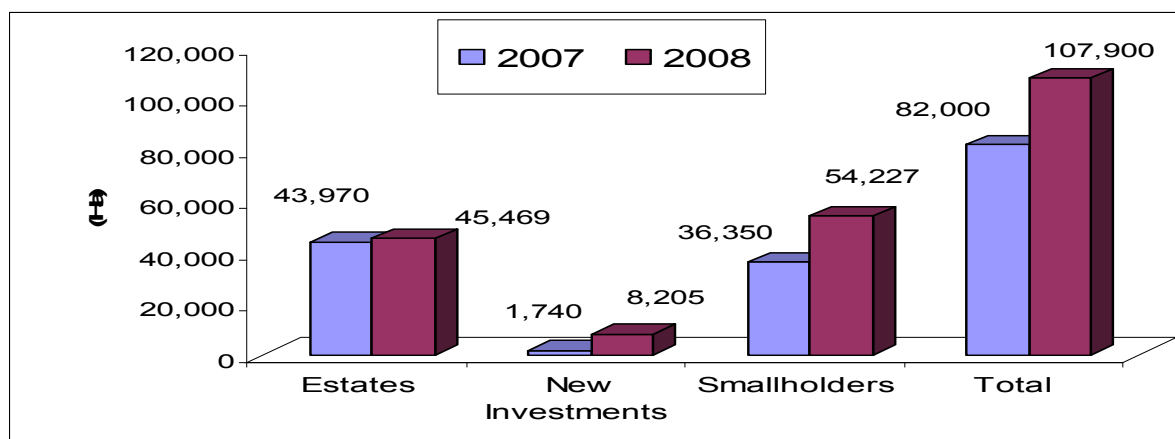


The livestock production is slightly increased. For cow raising, the numbers of population is increased around 13% if compared from 2004-2008. Pig production is dropped down from 2.42 million heads in 2004 to 2.21 million heads in 2008 due to some problems relating to the import flow of pigs from neighboring countries into Cambodia markets. The large import for pigs would affect the local pig raising in terms of competition for farmers and this production reported decreasing of -8% compared to last year, 2007.

The poultry production is considerably increased around 7.8% in 2005, 4% in 2006, 0.8% in 2007 and 7% in 2008. The poultry production of this year is reported progressively because of the prevention measures have been timely made, especially bird flu.

### 1.4 Rubber Production

Rubber is perennial crop which plays an important role in supporting socio-economic development including: (1) generating for households and national revenue (2) creating job opportunities for the rural people and retaining the migration moving from rural to urban areas and (3) contributing to environment protection against the global warmest/drought, soil erosion and creation of green forest cover.



It is reported that rubber cultivation reached at around 107,900 ha in 2008 which increased 31% in comparison with the year 2007 or equivalent to 72% of the Strategic Plan for 2015 (to be achieved at 150,000 ha).

The rubber production in Cambodia divided into 3 categories namely Rubber Estates, New Investments: Economical Concession Land and Smallholder Rubber Production. The rubber production has sequentially increased in particular the smallholding sector and the new investments with increase of around 16,000 ha and 6,470 ha respectively in 2008.

### 1.5 Forestry and Logging

The main target set in National Strategic Development Plan (NSDP), 2006-2010 for Forestry sub-sector are as follows:

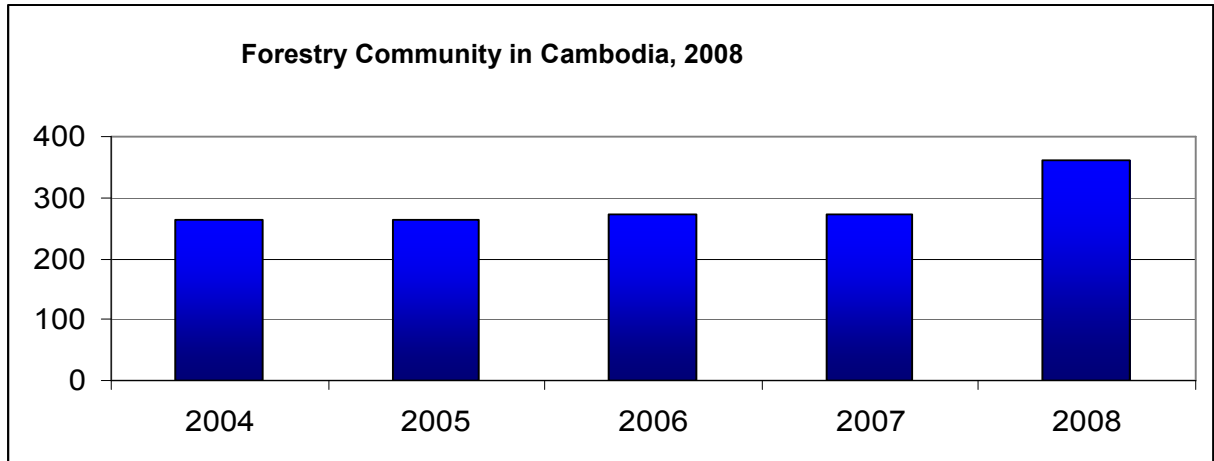
- *Ensuring sustainable forestry resource management and forest resource uses to benefiting the rural poor through forestry reform programme.*
- *Ensuring the forest cover reached 60% by 2010.*
- *Ensuring the fuel wood dependency reduced to 61% of total households by 2010.*

In order to implement the Forestry Reform Programme of the RGC, Forestry Administration (FA) has carried out suppression of illegal forest and wildlife activities and as results there are 686 cases of offenses were suppressed (illegal activities decreased 248 cases, compared with 934 cases in 2007). FA arrested 335m<sup>3</sup> of illegal logs and 1,540m<sup>3</sup> of timber, 1,349 head and 2,919 Kg of wildlife. It is informed that 18 illegal sawmills & 19 wood processing factories were eliminated.

The FA carried out field works and recorded that 52,621ha were encroached, burned, levered and occupied for illegal land ownership. As results of suppression, 3,421 ha of forestry land was confiscated in 2008. It is also reported that during 2004-2008, there were 464,861 ha recorded encroachment and 41,099 ha of forestry land was confiscated.

There are 3,973 concrete posts was demarcated as the permanent boundary for forest land areas with 733 km length at 13 provinces.

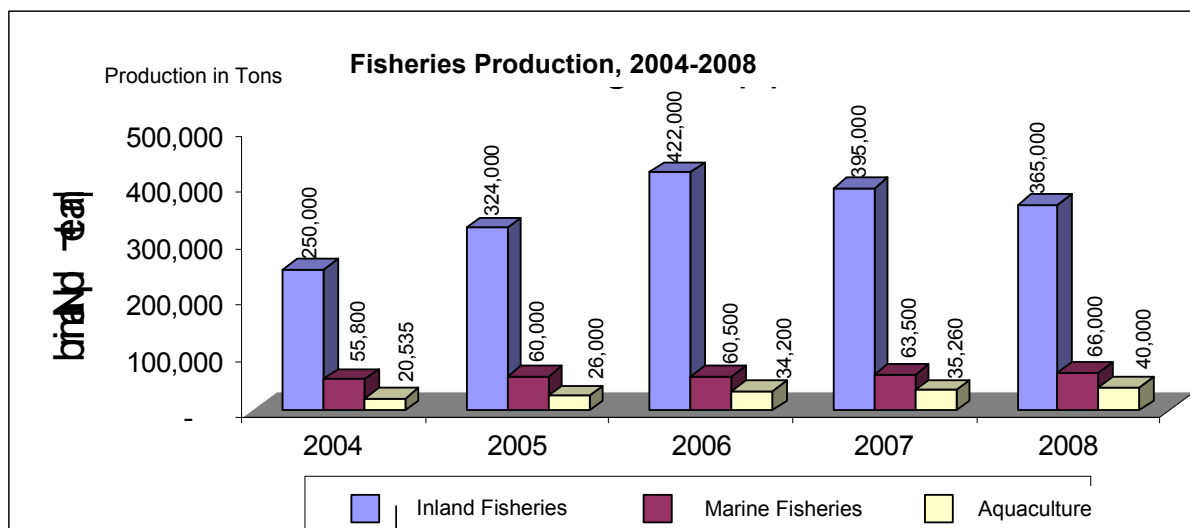
In 2008, the tree plantation of 8,590 ha was planted in which 900 ha planted by FA, 200 ha by Cambodia Royal Arm Force, 7,440 ha by private companies, 50.64 ha by Arbor Day. There are 6,022,000 of tree seedlings were planted and distributed to people for planting.



It is noted that 360 Forestry Communities established with the total areas of 325,130 ha, located in 20 provinces, 80 districts, 194 communes, 707 villages and around 79,924 families (about 300,000 people) participated in community activities. It is also reported that Forestry Communities increased from 264 communities in 2004 to 360 communities in 2008. Those are the main satisfactory achievements that FA attempted during the implementation of forestry reform programme of the RGC.

## 1.6 Fisheries Production

- **Inland Fisheries:** increased from 395,000 mt (2007) to 365,000 mt in 2008 due to the the affect from natural condition (lower water level).
- **Marine Fisheries:** the total catch is reported at around 66,000 mt in 2008, increase of 18% compared with last five years.
- **Aquaculture:** the total fish production is increased, 94% if compared with the production in 2004 and 2008.



The fisheries community development is a key element to accelerate aquaculture in Cambodia. At the present, 468 fishery communities established with the total members of 126,390 families (or 227,044 members) participated in fisheries production and conservation activities.

## Agriculture in the context of the national strategic development framework

### 1 GROWTH

The third side of the Rectangular Strategy consists of four strategic “growth rectangles”. These four rectangles outline the Royal Government's strategies to accelerate growth through: (i) the enhancement of agricultural sector; (ii) private sector growth and employment; (iii) continued rehabilitation and construction of physical infrastructure; and (iv) capacity building and human resource development. The specific strategies and priorities in each of the above four areas are described in the following sections.

#### **GROWTH**

- *Agriculture Sector*
- *Rehabilitation and Reconstruction Infrastructure*
- *Private Sector Development and Employment*
- *Capacity Building and Human Resources Development*

### 2.1 AGRICULTURE SECTOR

The fourth side of the Rectangular Strategy of the Royal Government has as its first strategic "growth rectangle" the enhancement of the agricultural sector as the backbone of the National Poverty Reduction Strategy and the goal to achieve sustained economic development. The Royal Government's agriculture sector development strategy is based on four key pillars: (i) improved productivity and diversification of agricultural production, (ii) land reforms and de-mining, (iii) fisheries reforms, and (iv) the forestry sector reforms.

#### **AGRICULTURE SECTOR**

- *Improved Productivity and Diversification of Agriculture*
- *Land Reforms and Mines Clearance*
- *Fisheries Reforms*
- *Forestry Reforms*

### 2.2 IMPROVED PRODUCTIVITY AND DIVERSIFICATION OF AGRICULTURE



For the agriculture sector the foremost priority of the Royal Government is to improve the agriculture sector's productivity and to achieve a greater diversification of agriculture activities to enable the agriculture sector to serve as the dynamic driving force for economic growth and poverty reduction. The policies proposed in the Rectangular Strategy to improve productivity and diversification of the agriculture sector activities include;

- Shifting the direction from «expansionary» or «extensive» agriculture to «deepening» or «intensive» agriculture, especially by increasing the yields using the existing land.
- Creating a favorable environment conducive to private sector participation in the agriculture sector by accelerating the distribution of land and the issuance of secure land titles within the framework of Social Land Concessions, particularly in the rural areas.
- Developing irrigation facilities and strengthening the management of water resources to improve productivity of the existing irrigation systems thus reducing the vulnerability of communities using irrigation systems to natural disasters.
- Expanding support services such as agricultural research and extension services, developing markets for agricultural products, distributing inputs, seeds, fertilizers and increasing availability of micro credit facilities in rural communities.
- Directing public investments and encouraging private investments in agriculture sector to increase agricultural production while ensuring that the quality of Cambodian agricultural products is improved to international standards.
- Developing border and remote areas to reduce out migration to urban areas.
- Developing township centers that are adequately equipped with infrastructure to promote local economic activities and to provide livelihood for local population.
- Promoting "one-village one-product" movement to encourage creativity and building confidence of the rural people by adopting four principles: (i) encouraging modes of production that are suited to village contexts and market needs, (ii) facilitating the identification of appropriate markets, financing, technology transfer and supply of inputs, (iii) providing support for human resource development and training in management, and (iv) facilitating the creation of agricultural communities in order to ensure stable prices for agriculture products.

### **2.3 To modernize the agriculture sector, the Royal Government will:**

**First**, increase the percentage of public investment allocations to agriculture and for rural development, particularly at the provincial and local levels for irrigation facilities, rural roads and other rural infrastructure, where construction services shall as much as possible be contracted by and accountable to Commune Councils.

**Second**, encourage increased private sector investment in farm and village-level enterprises in key sub-sectors including small-scale commercial, market-oriented agriculture, crop and livestock production, and agro-enterprises such as processing, post-harvest facilities and mechanization.

**Third**, accelerate and stabilize broad-based growth of agricultural output through sustainable development of high-value products.

**Fourth**, increase local-level expenditures and investments in: (i) extension services focused at increasing the productivity of farmers; (ii) farmer-owned and operated irrigation; (iii) rural enterprises; (iv) enhanced skills and capacity in lending to agricultural and agro-based enterprises; (v) decentralized public investments and de-concentrated budgeting and services for the agricultural sector; and (vi) revolving funds for farmers' groups managed according to micro-finance principles.

#### **2.4 In terms of specific actions, the Royal Government will:**

- Continue the implementation of National Water Resources Policy by rehabilitating the existing irrigation systems, constructing new effective irrigation systems, and strengthening their management.
- Increase cropping time per year including double cropping in lowland areas, and expand agricultural production on de-mined land and on unfertile unused land.
- Continue to focus on food security and increase food production, especially rice production and subsidiary crops.
- Increase agricultural products quality and promote processing agro-industrial development to increase farmers' value added and income.
- Increase the availability of micro-finance facilities to farmers for agricultural production.
- Develop agricultural diversification and intensification through improvement of soil quality, crop protection, seed supply system and agricultural mechanization (Production and harvest).
- Strengthen support for major services such as agricultural products market, extension services and research, and agricultural cooperatives.
- Improve cropping system, including crop diversification and animal production in form of "one village one product".
- Control and reduce the spread of infectious diseases.
- Assure public health by controlling animal and animal products.
- Enhance quality and safety products assuring public health as well as responding to market demands.
- Strengthen and enlarge animal production, and process animal waste.
- Promote privatization of state-owned rubber plantations.
- Promote smallholder rubber development, investment in rubber plantation, and increasing management of rubber sector.

### **3. LAND REFORMS AND LAND MINES CLEARANCE**

As stated in the Rectangular Strategy, land and water are the two fundamental natural resources that serve as the basis for socio-economic development and poverty reduction, especially in the rural areas. The policies outlined in the Rectangular Strategy on land reforms and mines clearance include:

- Commitment to continue to implement the Land Law and land policy to strengthen an equitable and efficient system of land management, distribution and utilization, including land registration and distribution, land tenure security,

eradication of illegal settlements and land grabbing and the control of land ownership concentration for speculative purpose.

- Review of idle and vacant State lands, as well as State land illegally occupied by private entities in contravention with the regulations and procedures.
- Strengthening of land tenure rights of the people who need small lots for settlement and family production within the social land concession framework, as a mechanism to assist poor households and vulnerable groups.
- Continue to guide the implementation of de-mining activities in accordance with international security standards and international obligations to ensure safe and well-coordinated implementation of the national de-mining plan.

### **3.1 Land Reforms**

In terms of specific actions, the Council for Land Policy and Ministry of Land Management, Urban Planning and Construction will:

- Develop a comprehensive land policy based on the Interim Paper on Land Policy Framework and lessons learned in the implementation of Land Management and Administration Project.
- Study to develop Policies and Procedures on the Registration of Indigenous Peoples' Land Rights.
- Develop policies and Sub-degree on State Land Management and Economic Land Concessions
- Contribute to develop land valuation system
- Continue the development of Policies and Circular on Co-ownership Registration and Right of Way (Road Corridors).
- Amendment to the law 1994 on Land Management, Urban Planning and Construction.
- Circular on the implementation article 18 under the Land Law in order to recover state land that unlawfully occupied.
- To implement social land concession, the Ministry carries on preparing guidelines on land identification, identification of target groups, and integrated development.
- Formulate construction code/standards and urbanization.
- Continue the development of National Housing Policy.
- Establish the regulatory framework for data management, NSDI (National Spatial Data Infrastructure).
- Establish surveying and mapping standard.
- Continue to study and research on land related issue such as state land economic, base line study on land, and potential social impact assessment.
- Adopt the joint declaration on the Role and Responsibility of Commune/Sangkat Administration in the area of land registration.
- Prepare the draft instruction manual on "Local Government in Land Issue, Land Administration and Construction".
- Continue to prepare the process of proper Demarcation of Commune/Sangkat's Boundary, and the pilot was carried out to begin the work that was later extended nation-wide implementation and printing Commune/Sangkat maps.

### 3.2 Institutional Development:

- Restructure the Ministry of Land Management, Urban Planning and Construction to cater globalization, information technology evolution, and the effective public services delivery.
- Develop human resources including (1) staff's capacity building in technical, legal, management and leadership areas, (2) continue to enhance educational quality in the Faculty of Land Management and Administration, (3) Prepare in-house Diploma degree curriculum in order to strengthening capacity at district level .
- Develop and implement the transparency and accountability strategy in all line functions for strengthening of good governance.
- With improvement of the exiting training manuals, train to systematic land registration teams of 350 officials, 100 quality control officials, 6 orthophoto production officials, administrative committee of 2000 officials, 100 officials on sporadic land registration, 365 provincial/municipal facilitators on participatory Land Use Planning, and 40 provincial/municipal staff on District Strategy Development Plan.
- To implement the de-concentration policy, through the evaluation of specialized capacity, and the scope of responsibility, the Ministry will be granted the delegated power on cadastral documents to three more provincial departments.
- The Ministry is underway to design and construct a new Ministry's building, the Faculty of Land Management and Administration's building, six provincial/municipality Department's buildings and 12 District/Khan Land offices.
- The Faculty of Land Management and Administration will recruit approximately 30 or 40 students for the 2004-2005 academic years.

### 3.3 Land Titling Program and Development of Land Registration Systems and Dispute Resolution:

- To assure land tenure security, decrease in land conflict and access to credit for investment the Ministry's target is to issue title for approximately 300,000 titles through both systematic and sporadic land registrations by year 2005 and **1 million titles by year 2007**. In addition, the Ministry continues to develop the culture of land registration, decrease the informal transaction of immovable property, thereby putting into practice an upgraded, efficient and transparent workflow in delivering services.
- Provide services in boosting the revenue collection through land transfer tax, unused land tax, revenue occurring from land use conversion value added, and cadastral fees.
- Continue to establish horizontal and vertical geodetic networks nation-wide and orthophoto maps for the overall country.
- Registration on specific state land sites for benefit of the country such as Angkor areas.
- Continue to strengthen out-of-court land dispute resolutions system (through Cadastral Commission), including the provision of legal aid to the disadvantaged with monitoring and evaluation system in country-wide.

#### **4. Land Mines clearance:**

Cambodia continues to be one of the most heavily land mined and UXO (unexploded ordnance) affected countries in the world. The land mines and the UXO left behind from the Vietnam War and the internal strife in subsequent period continue to cause hundreds of fatalities of innocent citizens each year. The Royal Government's target is to clear all severe and high impact suspected mined areas of land mines and UXO's by 2012, and to be free of all land mines and UXO's by 2020.

The Cambodia Mine Action Agency (CMAA) has updated its Five-Year Mine Action Plan for the period of 2004-2008 to achieve the mine clearing targets of the Royal Government. To achieve the land mines and UXO clearing targets, the CMAA will take following actions:

- Prioritize the clearance of high impact areas and have them cleared by 2009.
- Integrate mine clearance operations with development programs.
- Coordinate with de-mining operators to conduct technical survey as of 2005.
- Assist building the capacity of the RCAF in de-mining for development.
- Coordinate with operators to improve mine risk education activities.
- Inform all stakeholders on the contamination and clearance achieved.
- Improve cost efficiency of mine clearance as of 2006.
- Ensure post-clearance monitoring from 2005.
- Comply with the Cambodian Mine Action Standards as of 2005.

#### **5. REHABILITATION AND RECONSTRUCTION OF INFRASTRUCTURE**

Further rehabilitation and reconstruction of the infrastructure is the second of the four "growth rectangles" of the Rectangular Strategy. The four key pillars of this growth rectangle are: (i) restoration and reconstruction of transport infrastructure, (ii) management of water resources and irrigation systems, (iii) development of energy and power grids, and (iv) the development of information and communications technology (ICT). The policies and priorities in each of these areas are outlined in the following sections.

##### ***REHABILITATION AND RECONSTRUCTION OF PHYSICAL INFRASTRUCTURE***

- *Rehabilitation and Construction of Transport Network*
- *Water Resources and Irrigation System Management*
- *Development of Energy Sector and Electricity Network*
- *Development of ICT*

#### **6. NATIONAL AGRICULTURAL RESOURCE BASE**

Cambodia has a tropical monsoon climate which divides into two distinctive seasons; wet season from May to October and dry season from November to April. The wet season is interrupted by a short dry period of 15 days or a month's duration in July or August. The temperature across the country ranges from a mean daily minimum of 19 degree in January to a mean daily maximum of 35 degree in April. The average rainfall is about 1200 mm for most cultivated areas.

Population estimates in 2008 nearly 14 million with an average growth of 3 percent per annum. As mentioned earlier 85 percent of population lives in rural areas, of whom 75 percent are poor farmers.

##### **6.1 Institutional framework for agricultural development**

A significant feature of the shift from a command economy to a market economy is that a number of government institutions, like Ministry of Agriculture, Forestry and Fisheries, ultimately have a changed function within the agricultural sector. Services previously provided by the government are provided by the private sector, while farmers as a result of training and better educations about production choices and marketing options.

The new role of Ministry of Agriculture, forestry and Fisheries is one of advertising the national government on all policy issue affecting the sector, of generating new technology as a result of research, of providing information and transferring technology to farmers, agro-businesses and the community and in enforcing those regulation essential in managing the exploitation of natural resources in a sustainable manner for environmental conservation and to protect farmers, and consumers. This shift is recognized by the government as components of the National Programs for Administrative Reform (NPAR), which when fully implemented, will result in smaller but more professional government services at both the central level and in the provinces.

## **6.2 Priority areas for action to promote the development of the agricultural sector**

### **a/ Farmer's education ( extension)**

Before 1995 this work was extended to a limited audience by the Agricultural Research Station and Development Center, under the Department of Agronomy and Agricultural Land Improvement. However, from 1995 the Department of Agricultural Extension was responsible for farms education. The extension Service covered all aspects of agricultural production and marketing. Extension work is designed to accelerate the introduction of improved technologies and enhance the decision making skills of farmers, with increased use of demonstrations, farmer's field schools and mass media. The extension Services has worked closely with the provincial and districts administrators and operated as facilitator for some community based activities.

### **B/ Research on Agricultural Technology**

This is long term development objective and also mechanism for making sustainable agricultural progress. Research on agricultural technology and experimental activities will be focused on an agricultural system that takes into consideration the climate of Cambodia. It will ensure full operation of the research stations; technology transfer and extension; seeds production as well as crop protection methods. New technology activities would focus on the establishment of sample agricultural mechanization center, training in agricultural machinery, import of new agricultural machinery/equipment; agriculture land rehabilitation in some provinces bordering with Viet Nam and Thailand

### **C/ Access to rural finance**

This is related to other institution of government such as Ministry of Economics and Finance, Rural Development Board and National Bank. In order to improve agricultural productivity as well as to raise the living standard of its people, the government is interested in establishing rural agricultural bank as well as allowing international and national organizations to provide credit to farmers. To facilitate farmers access to credit, the government plans to loan funds to national organizations with experiences and defined rules in processing loans to farmers. Varying rate of interest between places and organizations as well as limited funds have created difficulties for farmers to access credit.

Some updates/ revision of the Decree have to be undertaken with regard to contract and other liabilities.

### 6.3 Existing Farm Practice in Cambodia

Operation	Power Sources	Implement/ Methods of Application
Tillage	-Animal -Machines	-Traditional plow with mild steel share -Disc plow, moldboard plow, disc harrow
Leveling of the soil	-Animal -Machines	-Comb harrow -Rotavator, Comb harrow
Irrigation	-Human -Machines	-Swing bucket, Snach, Pedal pump -Low lift pump, centrifugal pump
Weeding	-Human	-Hand pushed weeder, hand tools, spraying ( weedicide)
Spray	-Human	-Hand spray (type made of bamboo, plastic or metal tube), knapsack spray
Harvesting	-Human -Machines	-Sickle -Reaper, Combine harvester
Threshing	-Human  -Animal -Machines	-Beating against wood, walking over the swath. -Walking over the spread harvests -Tractor/hand tractor go drive over the spread harvest, thresters
Winnowing and drying	-Human  -Machines	-Shaking against air, Drying is done by spreading the swath on the field over in the sun, by spreading the paddy on the mat or other flat surface. - Electrical fan, Dryers (local made)







In an agricultural country like Cambodia, agricultural mechanization is essential to increase the land labor and crop productivity, Mechanization of farm operations offers several advantages which include timeliness of operation efficiency in performing farm operations, reduction in labor man-hours, and increasing land and labor productivity.

The use of machinery in agricultural activities has remarkably increased over the last 8 years. That is an important point in the development of agriculture, especially in the expansion of cultivated areas including the introduction and transferring of new technology through providing training and extension to farmers.

From 1993 to present, the department of Agricultural Mechanization has continued to cooperate with IRRI, CIDSE and RNAM/ UNIDO which resulted in the provision of agricultural machinery as well as equipment by these organizations for carrying out research activities as well as the extension of effective technique utilization.

From 2001-2008, the utilization of agricultural machinery in agricultural activities increased in the following areas and there are 271 shop that sell agricultural machinery in Cambodia

Items	2001	2002	2003	2004	2005	2006	2007	2008
<b>Harvesters</b>	-	-	-	-	-	395	395	430
<b>Tractors</b>	<u>3,072</u>	3,293	3,310	3,857	4,166	4,247	<u>4,475</u>	<u>4,611</u>
<b>Threshers</b>	<u>3,780</u>	4,199	4,967	6,220	7,338	7,795	<u>8,036</u>	<u>8,237</u>
<b>Hand tractors</b>	<u>8,789</u>	9,782	13,693	20,279	26,504	29,706	<u>34,639</u>	<u>38,912</u>
<b>Millings</b>	30,542	31,507	32,945	36,531	38,606	38,618	38,680	39,429
<b>Engine pumps</b>	<u>64,406</u>	82,622	99,875	106,569	120,968	127,610	<u>131,702</u>	<u>136,061</u>

### 6.5 Existing Traditional tools for agriculture (2008)

Name of equipment	Unit
-Traditional Plow	849.856
-Comb Harrow	765.839
-Cattle Cart	585.148
-Traditional Rotavator	8252
-Pedal pump	2812
-Swinging bucket	18533
-Snach	48492

Agricultural mechanization, such as the use of plowing and harvesting machines, paddy seed transplanting machines, tractors, "hand held tractors " for plowing wet rice field before planting " threshing machines, paddy milling machines etc., into planting, harvesting, and production and manufacturing system, is being accepted, and gladly preferred by farmers. The group expert officials has tried to provide training, as well as tests for manufacturing and production officials, continually showing the use of agricultural machine in the agricultural production to farmers at the basis.

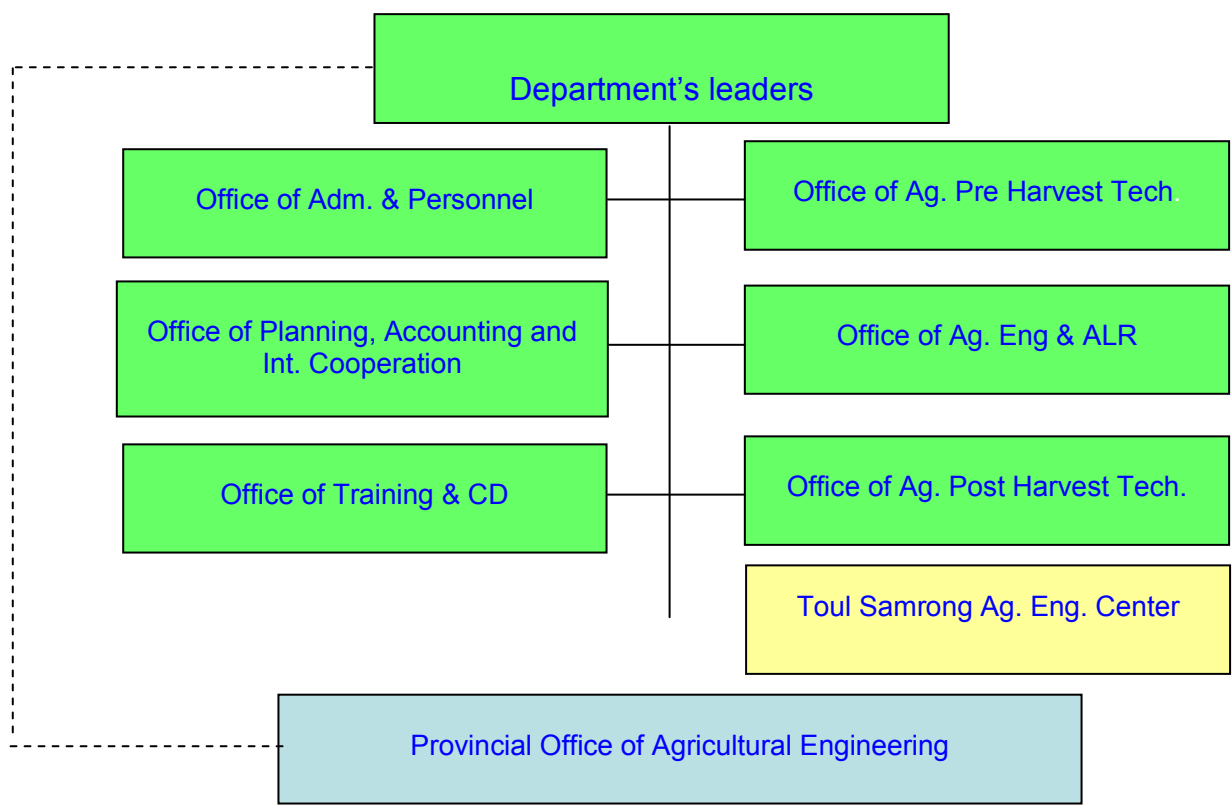
Farmers in the north provinces of Cambodia said that they prefer to use agricultural machines because they save more time than using traditional measure, such as plowing by cattle, or transporting by using ox-carts. Moreover, they do not have to care about food for their cattle, or to take care and to protect them from diseases, and after they have used the machines, they can do other tasks. In Cambodia, more and more farmers prefer to use

machines, since the government began reforms starting in 1987 by widely open free market mechanism. Most farmers produced to feed their families, some place began agricultural production for trading, because agricultural mechanization and other agricultural technique were spread by experts into the agricultural system. Until 1987, only the state used agricultural machines, and agricultural officials organized programs to plough farmers' land every year at the beginning of the rice planting season. " Agricultural Mechanization, which is being promoted by experts in the Cambodia agricultural production system, will become an important measure to increase agricultural productivity and production will be more efficient, both in terms of the quantity and quality of production, and it will be lead to greater productivity of paddy rice for food and for export,

**6.6 Organization Restructuring**

Ministry of Agriculture Forestry and Fisheries in collaboration with FAO has restructured its organization based on government reform policies. The restructured organization has a vertical management system. The important feature of the newly reformed organization is that some entities would become public enterprises, with autonomous management. Provincial Agricultural Departments and District Agricultural Offices would have to manage and strengthen their basic units to carry out effective and timely technology transfer as well as other tasks. There are three Agricultural Schools and Universities under Ministry of Agricultural, Forestry and Fisheries. The three educational institutions are : Royal University of Agriculture, Prek Leap Agricultural College and Kampongcham Agricultural College.

**V Department of Agricultural Machinery**



## **Major Responsibilities**

**The Department of Agricultural Machinery shall bear the following obligations:**

- Conduct research activities and indicate the zones where can be used appropriate agricultural machinery based on the characteristics of soil classification and kinds of crops in order to develop agricultural sector;
- Formulate principles and technical norms on potentiality and effectiveness of agricultural machinery in crop production;
- Research and initiate to produce agricultural tools and equipment for reducing labor uses in production;
- Advise and extend the techniques of machinery uses for improvement of agricultural production and productivity; and
- Undertake other duties which to be given by the leaders of the Ministry.

## **Major Activities:**

The Department of Agricultural Machinery is undertaking several activities to be solved facing problems in the central and local levels.

For the contribution of agricultural development of Cambodia, it is the priority for application of the Government policies to reduce poverty and to preserve food security.

Agricultural Machinery is very important. It can contribute in the activity of economic development to help farmers from poverty and they acquire the knowledge about techniques, utilization and maintenance of agricultural machines. The farmers can ameliorate and repair farm machines. They can reduce unemployment and provide their livelihood. Agricultural Machinery has a major impact on farm profitability.

Farm Mechanization has contributed establishing economics and developing agriculture at local level. It increases the professional training, social services, supporting the development of women and children and it reestablishes the institutions for supporting sustainable agricultural production.

The following are major activities of this department:

## **Agricultural Machinery Management**

- Establishment of agricultural machinery center at local level.
- Collecting data and statistics of production means.
- Research and development of agricultural mechanization.
- Legislation for future agricultural machinery management.
- Computerization of agricultural machinery management.

## **Production and Contribution of Agricultural Machines and Tools**

- Production of prototypes and machines as disk plough, moldboard plough, leveler, seeder, reaper, power thresher, pomp, power pomp, dryer and mill.

- Experiment of machines and tools.
- Repair and ameliorate machines and tools.
- Production of documents and books for agricultural machinery.
- Technical design for agricultural machines.

### **Education and Extension of Agricultural Mechanization**

- Conduct short-term training for agricultural machinery users.
- Production of documents and books for training.
- On field-demonstration of farm machines and tools.
- High-level training for staff and officials of the department.
- Extension of agricultural mechanization technology to farmers.

### **7. Conclusion**

- Extension of agricultural machinery and post-haves, pre-haves and food-processing technologies through demonstrations for their eventual commercialization and market expansion.
- Local manufacture of identified machinery through sharing of technologies.
- Development of agricultural and agro-related machinery through exchange of information and hardware (prototypes, design and drawings).
- Improvement of the working condition of women farm workers through their integration in mechanization and production activities.
- Formulation of strategies for appropriate agricultural mechanization, and skills development/programs related to agro-business.

### **References**

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