3. AN OVERVIEW OF THE STRATEGY, POLICY AND PROGRAMMES OF THE AGRICULTURE SECTOR

3.1 The Agriculture Perspective Plan

3.1.1 Objectives

The APP, which aims to increase per capita agricultural growth six fold from its current level of 0.5 percent to 3 percent per year, is conceived as a powerful engine of economic growth. This growth is envisioned to stimulate non-agricultural growth in employment-intensive goods and services throughout Nepal's dispersed villages and market towns. A major goal is to provide job opportunities to the poor, particularly poor women, and thereby help reduce the number of rural poor in the country.

Poverty alleviation and increased food security, in fact, are the major benefits expected from implementation of the APP. Its authors estimate that with implementation of the plan, the incidence of poverty may be reduced from 49 percent (1991/92 figures) to 14 percent in 2014/15. Without the APP, the corresponding figure in 2014/15 is estimated at 29 percent. The increase in agricultural productivity can also help protect the environment by allowing the most fragile land resources to be withdrawn from arable agriculture and returned to a more optimal state. Against this backdrop, the main objectives of APP are stated as follows:

- To accelerate the growth rate in agriculture through increased factor productivity;
- To alleviate poverty and achieve significant improvement in the standard of living through accelerated growth and expanded employment opportunities;
- To transform subsistence-based farming to commercial agriculture through diversification and widespread realization of comparative advantage;
- To expand opportunities for overall economic transformation by fulfilling the precondition of agricultural development; and
- To identify immediate, short-term and long-term strategies for implementation and provide clear guidelines for preparing periodic plans and future programmes.

3.1.2 Strategy

The strategy of APP is to accelerate agricultural growth rate sufficiently to obtain strong multiplier effects on growth and employment in both the agricultural and non-agricultural sectors. Growth is expected to occur through technological change achieved via investment in research and extension. The APP aims for broad-based participatory growth across regions and income classes and emphasizes subsectors that are particularly important to women.

The following six strategic moves are identified by APP as essential to its objectives:

- A technology-based green revolution in agriculture as the initial engine of accelerated growth;

- Accelerated agricultural growth that creates a demand-pull force for the production of high value commodities in agriculture as well as non-agricultural commodities with consequent large multiplier effects on other sectors of the economy;

- Broad-based and high employment growth subsequently serving as the mechanism for achieving societal objectives;

- Public policy and investment focus on a small number of priorities, building on past investments in human capital and physical and institutional infrastructure;

- Introduction of a package approach towards development that, in Nepal's case, should be differentiated for the *Terai*, hill and mountain regions, while recognizing the powerful complementarities between public and private investment and priorities and ensuring their coordination; and

- Achieving broad participation, particularly through a strategy that is regionally balanced and that explicitly ensures the participation of women.

3.1.3 Major programmes

The programmes of APP are based on different sets of priorities regarding input and output investment, policies and institutions. The APP emphasizes allocation of scarce resources on a small number of priority areas with promising growth potentials rather than spreading them thinly over a spectrum of activities that have very little or no potentials. The priority input investment sectors of APP are irrigation, roads, power, technology, and fertilizers. The annual average investment earmarked for priority inputs in the first five years is Rs 4 201 million while that slated for the priority outputs during the same period is Rs 1 278 million. The four priority output investment sectors targeted by the APP are livestock (focused mainly on milk), high value crops, agribusiness and forestry.

The plan also recommends adoption of four policy priorities and five institutional priorities for its successful implementation. The policy priorities are: 1) commitment to encourage an efficient and competitive private sector; 2) support for concentration of public investment in the four input priority areas; 3) price policy reforms and 4) land consolidation, particularly in the *Terai* and reform in land tenure. Similarly, the five priority institutions are: 1) creation of APP implementing agencies at the national and district levels; 2) creation of the Department of Agricultural Roads; 3) strengthening of the Agricultural Development Bank of Nepal (ADB/N) to support shallow tubewells (STWs), private fertilizer trade and rapid growth of priority outputs; 4) transformation of the Agricultural Inputs Corporation (AIC) to function as a lead agency to meet fertilizer targets and provide assistance to the private sector and 5) redefinition of the functions of the Nepal Agricultural Research Council (NARC) and the Department of Agriculture(DOA) to redirect their efforts in line with APP priority inputs and outputs.

3.2 Agriculture Sector Objectives, Strategies and Policies of the Ninth Plan

The Ninth Plan recognizes poverty as the main obstacle to achieving desired progress of the country through planned developmental activities. Therefore, the plan has adopted poverty alleviation as its main objective. The plan document has also set out to formulate a clear and concrete implementation strategy for meeting poverty alleviation targets and thereby improve the living standard of the poor. To effectively reduce poverty in the long run, poverty-focused sectoral and targeted programmes will be launched in a coordinated, integrated and effective way.

3.2.1 Agriculture sector objectives

The Ninth Plan has adopted the recommendations of APP for achieving long-term development of agricultural sector in the country. Accordingly, its objectives are guided by the APP's overall framework for poverty alleviation. To achieve the long-term targets of APP in the areas of production, food security, employment and income growth, the objectives of the Ninth Plan in agriculture sector are set as follows:

- To alleviate poverty by increasing productivity of resources and inputs and by generating opportunities of employment by speeding up economic growth in the agriculture sector;
- To prevent environmental degradation via a balanced use of external inputs and natural resources in agricultural production systems;
- To strengthen the foundation of agrobased industry and industrialization through diversification and commercialization of agriculture;
- To develop leadership of women by increasing their participation in agricultural development and production programmes; and
- To promote food security and improve the nutritional status of the people by increasing the production of foodgrains and other nutritious food items.

3.2.2 Agriculture sector strategy

The strategy adopted by this plan involves harnessing a green revolution through improved technology, adequate utilization of available infrastructure, exploitation of comparative advantage and implementation of development programmes with large-scale public participation and women's involvement and which are selected according to avowed priorities.

3.2.3 Agriculture sector policies

The policies of the Ninth Plan are guided by the need to effectively implement the APP programmes and ensure long-term sustainability of the chosen path of development while improving fragile interrelationships among agriculture, forests and the environment. Hence, the basic policy of the plan is to treat agriculture as the lead sector for economic development and poverty alleviation through increased employment opportunities and income levels of the common people. The different components of this strategy are as follows:

- Ongoing programmes will be restructured and additional programme budgets and manpower management oriented toward the priorities of APP.

- Land reform programmes will be implemented to eradicate dual ownership, squatting and bonded labour problems.

- Special attention will be given to increased foodgrain production, livestock raising, vegetable production and fruit cultivation to improve nutritional status and food security of common people and to engender equitable distribution of income between the urban and rural areas.

- Appropriate policy, services and support programmes will be instituted to promote cash crop production for the development of agrobased industries. Emphasis will be placed on developing these industries as major consumers of agricultural products.

- Adequate support will be provided to public, private and non-government sector institutions to ensure regular and reliable supply of inputs such as chemical fertilizers, improved seeds, improved animal breeds and credit, mainly by making the marketing mechanism effective.

- Local farmers and entrepreneurs will be encouraged to develop resource centres for the production and supply of inputs. By identifying appropriate services and support programmes, these centres will be used to render technology transfer and training services currently being provided by agri-extension service centres. At the same time, service centres will also be made more effective and active towards appropriate technology transfer.

- Agriculture extension and information services will be directed towards catering to the comparatively beneficial production systems as well as to promoting agrobusiness and strengthening market information systems.

- Agricultural farms will be made more productive through optimum utilization of available resources and privatization of feasible farms.

- Agriculture research will be carried out to address location-specific technological needs of the farmers. The quality of the manpower engaged in research will be upgraded by providing them with opportunity to acquire higher academic qualifications such as postgraduate and doctorate degrees.

- The structure of the current agricultural statistics, market development and economic analysis programmes will be reviewed and consolidated to improve local capability to analyse external and internal market opportunities.

- In the first half of the plan period, subsidy in fertilizers will be completely removed. Opportunities will be opened for private sector to participate in the fertilizer business. The private sector will also be encouraged to establish a chemical fertilizer factory if this is found to be feasible.

- Integrated package programmes will be implemented in areas suitable for development as pockets of prioritized agricultural products and continued where such programmes have already been initiated.

- In accordance with the APP, feasible tubewell development programmes will be given high priority in the *Terai*. In the hilly areas, emphasis will be placed on the rehabilitation and maintenance of existing irrigation systems, development of feasible small-scale surface systems and sprinkler irrigation as well as construction of ponds for rainwater harvesting.

- Present institutional arrangements will be strengthened and extended to ensure easy access to agricultural loans. Animal insurance services will be strengthened and crop insurance programmes initiated.

- Cooperative programmes will be conducted to mobilize the economically active age group by motivating them to engage in business. Priority will be given to the already existing groups involved in agriculture-related programmes. If required, even new groups can be created for this purpose.

- High emphasis will be given on the production of nutritious food and their proper utilization through effective food technology, nutrition and processing programmes. Laboratory facilities will be provided to serve and support the provisions of the Food Act.

- Programmes and their effectiveness will be monitored on a regular basis. Organizations responsible for this will be strengthened.

3.3 Major Agriculture Sector Programmes

3.3.1 Overall programmes

The programmes of the Ninth Plan have been grouped into two major headings: 1) prioritized programmes and 2) other programmes needed to spur development. The prioritized programmes are based entirely on the APP priority sectors while the other programmes address those sectors that are not on the APP priority list but are necessary to boost agriculture production.

Major production growth targets set by the Ninth Plan for the agriculture sector is summarized in Table 3.1 with further details in Appendix Table 7. The plan targets to achieve an average annual growth of 5.33 percent during the plan period. With regard to subsectors, highest growth is envisaged under fisheries (8.76 percent) and followed respectively by cash crops (6.5 percent), pulses (6.04 percent), livestock (6 percent), foodgrains (5.18 percent) and horticulture (3.54 percent).

Table 3.1: Major agricultural growth targets of the Ninth Plan

Subsectors	Base year weight (1996-97)	Annual growth (%)	Final year weight (2002-3)
Foodgrains	41.13	5.18	52.94
Cash crops	6.62	6.50	9.07
Pulses	2.17	6.04	2.91
Horticulture	13.84	3.54	16.47
Livestock	35.78	6.00	47.56
Fisheries	0.46	8.76	0.70
Agriculture sector	**100.00**	**5.33**	**129.63**

Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

The targeted growth in the agriculture sector by the plan is about 120 percent of the growth targeted by the APP in the first five years and 112 percent of that envisaged under the interim APP. Upward adjustments in the growth rate of the plan compared to APP target have been made to incorporate subsector growth not prioritized by the latter.

3.3.2 Cropping intensity and productivity programmes

In line with the priorities set by the APP, the Ninth Plan has envisaged to launch intensive foodgrain and cash crop production programmes to increase cropping intensity and crop productivity over the plan period by packaging inputs (e.g. fertilizer, seeds, plant protection measures, agricultural credit, and technology) in areas served and or scheduled to be served by irrigation facilities and which are connected or about to be connected by roads. Intensification programmes envisioned to increase cropping intensity and productivity for prioritized crops are presented in Table 3.2 with further details provided in Appendix Table 8 and Table 9.

Table 3.2: Targeted change in crop yield and intensity of the Ninth Plan

mt/ha

Programme type and crops	1996-97 yield & CI	2002-03 yield & CI	Annual change in yield and CI
Paddy	2.64	3.38	5.61
Maize	1.71	2.26	6.43
Wheat	2.51	2.77	2.07
Potato	8.74	9.29	1.26
Lentil	0.73	1.03	8.22
Vegetables	9.25	10.73	3.20
Crop intensity (%)	160.0	172.0	1.70

Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

During the plan period, productivity of prioritized crops with irrigation under the Pocket Package Programme (PPP) is expected to grow annually by about 5.6 percent for paddy, 6.4 percent for maize, 2.1 percent for wheat, 1.26 percent for potato, 8.2 percent for lentil and 3.2 percent for vegetables. Cropping intensity during the period is expected to grow annually by an average of 1.7 percent and to reach 204 percent in the last year of the plan.

3.3.3 High value commodities programmes

The Ninth Plan has prioritized the production of high value agricultural commodities in areas linked to roads by encouraging coordinated delivery of inputs and technology and mobilization of farmers groups and the private sector. These include citruses, apples, vegetable seeds, off-season vegetables, sericulture and apiculture. The plan envisages attaining an overall annual growth of 3.54 percent for this sector. Growth targets for specific commodities are presented in Table 3.3 below with further details in Appendix Table 10.

Among the fruits, citruses and apple are the two commodity types prioritized for the hills and mountain areas, respectively. Productive area planted to citruses is expected to grow by an average of 5.72 percent annually during the plan period while production and yield are envisioned to grow by 7.10 percent and by 1.72 percent, respectively. In similar manner, productive area, production and yield of apple is expected grow annually by an average of 1.72 percent, 0.21 percent and 1.96 percent, respectively. With regard to both types of fruits, higher emphasis has been laid on commercial cultivation by private sectors in orchards. The plan targets increasing apple production in new areas in orchard form. Total apple area is expected to grow by an average of 21.4 percent annually during the plan period.

Table 3.3: Targets for the production of priority fruits of the Ninth Plan

Priority commodities	Area (ha)		Yield (mt/ha)	Production (mt)
	Total area	Productive area		
Citrus: 1996/97	15 924	9 330	9.97	92 994
2002/03	20 924	12 000	10.5	126 000
Ave. annual change (%)	6.28	5.72	1.06	7.10
Apple: 1996/97	4 652	3 006	9.5	28 598
2002/03	9 627	3 264	9.6	31 397
Ave. annual change (%)	21.39	1.72	0.21	1.96

Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

Vegetable seeds and off-season vegetable production are also prioritized programmes of the Ninth Plan. Production of quality vegetable seeds is expected to grow annually by about 13.4 percent during the plan period (Table 3.4). Production is targeted to reach 700 mt in 2002-03 from 419 mt in 1996-97. Area dedicated to commercial cultivation of vegetables including off-season vegetables is similarly anticipated to rise from 145 000 ha in 1996-97 to as much as 160 000 ha in 2002-3, for an average annual growth rate of 2.1 percent. Yield and production during the period are expected to grow annually by about 3.0 percent and 5.4 percent, respectively.

Table 3.4: Targets for the production of vegetables and vegetable seeds of the Ninth Plan

Commodities	Area (ha)	(mt/ha)	(mt)
Vegetable seeds: 196/97	–	–	419
2002/03	–	–	700
Ave. annual change (%)			13.4
Off-season vegetables: 196/97	145 000	9.3	1 350 000
2002/03	160 000	10.7	1 716 000
Ave. annual change (%)	2.1	3.0	5.4

Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

The plan envisages integrating apiculture with fruit production. Production of honey, estimated at about 60 mt in 1996-97, will be increased to about 85 mt in 2002-3. To achieve targets, the plan prescribes provision of training for farmers, especially the women farmers, establishment of resource centres at the level of enterprising farmers and coordinated delivery of required technical and marketing services.

Recognizing the silk industry's income-generating potential and employment enhancing (particularly for women) and environmentally friendly nature, the plan has prioritized sericulture development in selected districts. Priority programmes include enhancing national capacity for the production of silkworm eggs, human resource development, development of farmers' organizations specialized in silk production and development of women farmers groups. During the plan period, mulberry area is targeted to increase annually by an average of 55 percent while that of castor by 25 percent. Silkworm cocoon production will likewise be increased annually by about 139 percent (Table3.5).

Table 3.5: Sericulture development targets of the Ninth Plan

Programme	1996/97	2001-02	Growth (%)
Mulberry area (ha)	217.0	817.0	55.30
Castor area (ha)	24.0	54.0	25.00
Cocoon production (mt)	24.5	194.5	138.78

Source: Ninth Plan, NPC, 1998.

Tea, coffee, cardamom, spices and other subtropical and temperate fruits have not been prioritized by APP because of their low base and limited (area-specific) potential but are included in the Ninth Plan as high value commodities. During the plan period, area under tea plantation is estimated to increase from about 3 564 ha in 1996-97 is expected to reach to about 4,564 ha, a net addition of about 1000 ha. This implies an average annual growth of 5.6 percent per annum. During the plan period both the productive area and production will increase annually by about 7.7 percent (Table 3.6).

Table 3.6: Tea and coffee development targets of the Ninth Plan

Crops	Programme	1996/97	2001/02	Ave. annual growth (%)
Tea	Total area (ha)	3 564	4 564	5.6
	Productive area (ha)*	2 407	3 156	7.8
	Tea production (mt)*	3 129	4 102	7.8
Coffee	Total area (ha)	300	444	9.6
	Productive area (ha)*	130	252	23.5
	Production* : Dry beans (mt)	171	332	23.5
	Parchment coffee (mt)	57	110	23.2
Cardamom	Total area (ha)	9 554	10 000	0.93
	Production (mt)	4 456	4 700	1.10
Other Fruits	Total area (ha)	42 344	45 469	1.48
	Production (mt)	306 636	342 603	2.35
Spices	Total area (ha)	11 636	12 000	0.63
	Production (mt)	87 208	89 800	0.59

*Denotes 1997/98 figure.
Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

Additional areas planned are expected to become commercial orchards with a minimum size of 150 ha each and located in the *Terai* and hill areas of the EDR that are connected or set to be connected by roads and which have electricity facilities for private processing. The plan envisions providing other inputs such as credit, technical services and access through short distance agriculture roads to such areas. The plan also envisages privatizing the activities of the Nepal Tea Development Corporation (NTDC) during the plan period.

In the coffee sector, the plan has programmed to increase total coffee area in the country by an average of 9.6 percent per annum and productive area, dry bean production and parchment coffee production by about 23 percent each. Support programmes planned include provision of technical services for farm level primary processing, technology development and training and coordinated delivery of inputs and services (e.g., credit, technical services) and short distance agriculture roads to improve access such areas. Programmes have also been designed to increase production of cardamom, fruits and spices by about 1.1 percent, 2.35 percent and 0.6 percent annually, respectively, during the plan period. Emphasis has been placed on commercialization and coordinated delivery of inputs, technical services and marketing facilities.

3.3.4 Livestock and poultry production programmes

In line with the priorities set by APP[16], the Ninth Plan has accorded due priority to the development of the livestock sector and aims to increase the productivity and production of major livestock products such as milk, meat and eggs. Strategies incorporated in the sector's programme include livestock breed improvement, milk collection and processing, livestock feed improvement, livestock health enhancement, human resource development, livestock farm management improvement, development of livestock markets and livestock credit provision. The plan has envisions adopting the PPP strategy in the implementation of the priority programmes by organizing farmers into commodity specific groups. Programmes in the livestock sector include pasture development, women-focused livestock development, special programmes for marginal groups, rabbit development and livestock insurance.

Under the breed improvement programme, plan targets include providing artificial insemination services to a total of 350 000 cows and 130 000 she buffaloes over the allotted period. Annual increments in the programme over the plan period, meanwhile, are set at 38.4 percent and 45.6 percents, respectively (Table 3.7).

[16] The APP has set a target of increasing milk, meat and egg production in the next 20 years by an average of 6.2 percent per annum so that the country will not only be self-sufficient in these commodities but also be able to generate export earnings. During this period, contribution of the sector to GDP, which is about one-third at the moment, is expected to increase to about 43.2 percent.

Table 3.7: Livestock breed improvement targets of the Ninth Plan

Programme	Plan target (No)	Annual change (%)
Artificial insemination		
Cattle	350 000	38.4
Buffalo	130 000	45.6
Total	480 000	40.3
Distribution of improved breeds		
Bulls	2 120	37.1
He-buffalo	2 500	14.6
Goat	15 500	59.6
Sheep (*thuma*)	2 400	68.2
Cockerel	45 000	18.9

Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

Breed improvement planned through natural processes (i.e. through a distribution of males of improved breeds to farmers) has been set at 2 120 cattle bulls, 2 500 he-buffaloes, 15 500 he goats, 2 400 bucks and 45 000 cockerels. These imply that facilities over the plan period will be increased annually by about 37.1 percent, 14.6 percent, 59.6 percent, 68.2 percent and 18.9 percent for the respective livestock species.

The livestock feed development programme of the plan comprises distribution of improved seeds of different grasses (i.e. summer, winter and annual, and perennial). The plan targets distribution of about 932 mt of annual grass seeds (summer and winter growing types) during the plan period. Likewise, a total of 416 mt of perennial grass seeds and 165 mt of grass seeds for pasture development are planned for distribution. In a similar manner, a total of 22 million fodder saplings are planned for distribution. These figures imply that the respective programme will grow annually by about 18.3 percent, 39.8 percent, 62.6 percent and 52.6 percent, respectively (Table 3.8).

Table 3.8: Feed improvement targets of the Ninth Plan

Programme	Plan target (No)	Increment/annum (%)
Grass seeds	932	18.3
Perennial grass seeds	416	39.8
Pasture grass seeds	165	62.6
Fodder saplings	2,161	52.6

Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

The Ninth Plan also envisions the following major programmes: establishment of a separate Central Avian Diagnostic Laboratory for the effective diagnosis and control of poultry diseases, a unit for the standardization of domestically produced and imported vaccines for the control of livestock diseases, 66 livestock dispensaries in the private sector; operation of 40 district level and 14 zone level livestock disease control laboratories; and the immunization against the major livestock diseases.

As shown in Table 3.9, 745 000 heads of cattle and buffaloes will be vaccinated against foot-and-mouth disease (FMD), 372 000 heads against black quarter and 744 000 heads against haemorrhagic septicemia under the immunization programme. In like manner such facilities will cover about 3.7 million goats and sheep against both FMD and haemorrhagic septicemia. Extension of vaccine facilities is expected to increase annually by about 18 percent for cattle and buffaloes and by about 56 percent for goats and sheep over the plan period.

Table 3.9: Livestock vaccination targets of the Ninth Plan

Programme	Plan target (in 000)	Increment/annum (%)
Cattle and buffalo		
Foot and mouth rot	745	18.5
Black quarter	372	18.3
Haemorrhagic septicemia	744	18.3
Goat and sheep		
Foot and mouth rot	3 705	56.2
Haemorrhagic septicemia	3 705	56.2

Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

In order to launch an intensive livestock programme on a priority basis for the development of the livestock sector through programme packaging, the plan has targeted to form farmers' groups under different categories. Table 3.10 presents the overview of the targets.

Under the priority programme, a total of 6 360 farmers groups are planned to participate in the implementation of livestock development activities on commercial scale, 6 740 groups in the implementation of priority livestock development activities by women and 5 540 groups in the implementation of priority livestock development activities by the poor farmers. The package programme for the implementation of priority livestock development programme on commercial scale is expected to grow annually by about 33 percent over the plan period, while that under women farmer groups and poor farmer groups are anticipated to increase by about 50 percent and 53 percent respectively. The plan targets to form a total of 1 120 farmers groups for the implementation of other livestock development activities such as swine farming, rabbit farming under the ordinary programme category and through the package approach.

Table 3.10 Livestock Priority package programme targets of the Ninth Plan

Particulars	Plan target (in 000)	Increment/annum (%)
Priority Programmes		
Commercial Programme	**6 360**	**32.7**
Cattle group	1 960	23.3
Buffalo group	1 560	21.8
Goat/sheep group	2 620	57.4
Poultry group	220	16.4
Women Development Programme	**6 740**	**50.0**
Cattle group	500	16.7
Buffalo group	700	25.7
Goat/sheep group	5 240	57.4
Poultry group	300	8.8
Poverty Alleviation Programme	**5 540**	**52.6**
Goat/sheep group	5 240	57.4
Poultry group	300	8.8
Ordinary Programmes	1 120	28.3
Pig farming	650	28.4
Rabbit farming	220	34.2
Sheep farming	250	23.4

Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

The major human resource development programmes envisaged by the plan for the livestock sector include training farmers and mobilizing them as Village Livestock Technicians, enhancement of the capacity of livestock technicians through provision of in-service training, creation of professional manpower in the livestock sector and provision of foreign training opportunities for livestock technicians. Other programmes included are: gradual conversion of the 11 livestock development farms into livestock breeding/resource centres, establishment of a National Poultry Production and Marketing Centre in the private sector and strengthening of livestock markets through promotion of slaughterhouse and cold storage facilities. With the implementation of these priority programmes, production of milk, meat and eggs is expected to grow by a compound (annual) rate of 5.56 percent, 6.22 percent and 7.22 percent, respectively, during the plan period. Net incremental production targeted for these respective commodities is expected to reach 59.6 million mt, 10.6 million mt and 2 580 million (Table 3.11).

Table 3.11: Livestock production targets of the Ninth Plan

Particular s	Plan target	Growth rate/annum (%)
Milk (000 mt)	59 690	5.56
Meat (000 mt)	10 560	6.22
Eggs (million)	2580	7.22

Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

3.3.5 Fisheries development programme

Fisheries are not the prioritized by APP. However, the Ninth Plan has set a fisheries development programme to achieve 6.7 percent annual growth in the expansion and coverage of water surface area, 7.6 percent in the production and distribution of fingerlings and 8.6 percent in fish production (Table 3.12).

Table 3.12: Fisheries development programme targets of the Ninth Plan

Programme	1996/97	2001-02	Annual growth (%)
Water surface area (ha)	5 433	7 500	6.67
Fingerlings Production/distribution (000)	55 354	80 000	7.64
Fish production (mt)	23 207	35 000	8.56
Aquaculture	11 977	17 100	7.38
Natural sources	11 230	17 900	9.77

Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

Targets for the production of fish are slated to be achieved through both expansion of water surface areas and increases in productivity. The plan has also set targets for the setting up of a Central Fish Laboratory to look into the problems of the fisheries sector. The plan emphasizes fish production both in natural water bodies and artificial ponds. The private sector is encouraged to produce about 75 percent of fingerling requirements and traditional fishermen to engage in long-term leasing of traditional fishponds. The plan also calls for the coordinated delivery of technical services and other inputs and promotes a package approach in the commercial production of fish in artificial water surface areas and ponds. The major strategy in natural water fisheries involves promotion of fish species having export demand and protection of the natural environment through training of stakeholders.

3.3.6 Agricultural business promotion programmes

The Ninth Plan's programme for the promotion of agricultural business is more policy oriented than it is programme activity focused. The plan aims to adopt suitable policy measures required to promote small businesses based on APP priority inputs and outputs. Broadly, promotion of agricultural business has been conceived as a major tool to provide necessary impetus to commercialize the agriculture sector. Major programmes envisaged by the plan for the promotion of the agribusiness sector include:

A. Formation of a high level Agribusiness Promotion Committee

The committee will be represented by the private sector, agricultural cooperatives, commodity-specific producers' associations and related organizations of Her Majesty's Government of Nepal (HMG/N). The committee will assist HMG/N in the following tasks:

- Formulating appropriate policies required for the commercialization of agricultural commodities;

- Creating a conducive environment in forming private-public sector partnership in agriculture development, prepare implementation plan of the programmes set by the Ninth Plan for the commercialization of the agriculture sector;

- Monitoring and evaluating agriculture business activities; and

- Establishing linkages between producers and agro-industries and play a key role in the identification and solution of problems in the agribusiness sector.

B. Establishment of an Agribusiness Promotion Division within MOAC

The plan has envisaged establishing an Agribusiness Promotion Division within the Ministry of Agriculture and Cooperatives (MOAC) to support promotion of agricultural enterprises and establish agro-industries. To be brought under this division are functions currently carried out by divisions and units within the MOAC and its departments that are related to agribusiness and agro-industries such as that of the Statistical Division of the MOAC and the economic analysis and market development divisions of the DOA. More specifically, the new division will serve as the executive agency of the government in operationalizing the vision, concepts, strategies, policies and programmes related to the promotion of agribusiness and agro-enterprises as well as work as liaison agency of the government to coordinate the activities of the private sector and farmers groups including cooperatives, NGOs and other related organizations. It will also function as the secretariat of the Agribusiness Promotion Committee.

3.3.7 Irrigation development programmes

The Ninth Plan has set an overall target to provide irrigation facilities to an additional 249 400 ha of agriculture land from ongoing projects and projects to be initiated during the plan period. Of the total area planned, about 43 percent is planned through improvement in the canal system of existing projects. In line with the priorities set by APP, the Ninth Plan has laid the priorities for the development of irrigated agriculture. Accordingly, the plan has set a target of providing irrigation facilities to additional 155 000 ha (62 percent of Ninth Plan target) on a priority basis through rehabilitation of old farmer-managed irrigation systems; installation and operation of shallow and deep tubewells and through construction of small irrigation schemes. About 58 percent of the prioritized programmes constitutes ground water development in the *Terai*. This is fully consistent with and an exact reflection of projected programme of the APP (Table 3.13).

Of the total area prioritized, about 82 percent are expected from new projects and the rest from rehabilitation of FMIS. Majority of new areas to be brought under irrigation, about 63 percent is planned through ground water systems to be implemented by DOI and the ADB/N. Further details are provided in Appendix Table 11.

Table 3.13: Prioritized irrigation programme of the Ninth Plan

Programme type	Prioritized Programmes			Ninth Plan Target
	New areas	FMIS improvement	Total	
FMIS New	52 400	0	52 400	62 400*
FMIS rehabilitation	0	12 600**	12 600	97 000***
Shallow Tubewell	60 000	0	60 000	78 350
Deep Tubewell	30 000	0	30 000	11 650
Total	**142 400**	**12 600**	**155 000**	**249 400**

* Includes 10 000 ha planned under NGO sector.
** Includes 4 000 ha of new small irrigation projects.
*** Includes 500 ha of ground water to be rehabilitated.
Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

3.3.8 Fertilizer procurement and distribution programmes

In line with the priority set by APP, the Ninth Plan has adopted a policy to deregulate fertilizer trade by involving the private sector in the procurement and distribution of fertilizer and by withdrawing of subsidy on fertilizers. Within these broad policy guidelines, the plan has planned to increase import and distribution of chemical fertilizers annually by about 22.6 percent during the plan period (Table 3.14)[17]. Together with the increased supply planned, the plan has envisaged to expand government facilities and level of technical services to provide soil- testing facilities to farming communities to ensure better soil management.

Table 3.14: Fertilizer supply targets of the Ninth Plan

	Supply Target (mt)		
Fertilizer nutrient	**1996/97**	**2001/02**	**Annual growth rate (%)**
Nitrogen	43 242	128 202	24.3
Phosphorous	19 283	47 186	19.6
Potash	1 635	2 671	10.3
Total	**64 160**	**178 059**	**22.6**

Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

17 Total fertilizer nutrient supply planned during the plan period is about 703 063 mt, of which the share of nitrogen, phosphorus and potash are 72 percent, 26.5 percent and 1.5 percent, respectively.

The plan has also envisaged setting up a *Fertilizer Promotion Committee* with representation of all those related to fertilizer import, distribution and use and a Fertilizer Unit (FU) within the MOAC to regularly monitor fertilizer imports, distribution, quality control and to formulate policies as required in the country. This unit will work as the secretariat of the committee.

3.3.9 Supply of agriculture credit programmes

To help operationalize priorities set by the APP, the Ninth Plan has set targets on the provision of agriculture credit to farmers by mobilizing all the possible financial institutions such as the ADB/N, commercial banks, rural development banks and private and cooperative financial institutions. Required policy changes regarding financial institutions such as the freedom to set interest rates on a competitive basis, the provision of collateral free credit to poor and disadvantaged sections through groups and encouragement of financial institutions to provide necessary technical services via provision of overhead costs are also being planned. The plan has also envisaged forming a Central Level Agricultural Credit Monitoring Committee with representation of concerned financial institutions under the leadership of the Central Bank.

The targets for agricultural credit flow of the Ninth Plan are furnished in Table 3.15. According to the plan, credit totaling Rs 17 152 million will ideally be funneled into the priority sectors of agriculture. Planned agricultural credit flow over the period will hence increase annually by about 23 percent from Rs the 2 088 million planned for the first year.

Table 3.15: Agricultural credit flow targets of the Ninth Plan

Credit items	Amount planned (Rs million)	Annual growth targeted (%)
Fertilizers	6 629	44.1
Shallow tubewells	1 509	46.3
Livestock	5 893	8.3
High value crops	384	19.8
Agro-industry	2 736	10.0
Total	**17 151**	**23.3**

Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

Of the different priority sectors, annual increments in the flow of credit will be highest for STWs (46.3 percent) followed respectively by fertilizers (44.1 percent), high value crops (19.8 percent), agro-industries (10 percent) and livestock (8.3 percent). Of the total credit flows projected, about 72 percent will be coursed through ADB/N, 14 percent through commercial banks and the rest (9 percent) through rural banks.

As mentioned earlier, the plan targets bearing Rs 75 million as overhead cost against ADB/N's involvement in the installation and loan financing of about 32 000 STWs. Likewise, the plan involves a programme providing Rs 128 million in support of financial institutions and credit related raining to farmers as well as to aid local saving and credit organizations.

3.3.10 Agricultural roads and rural electrification programmes

To buttress rapid growth in the agricultural production and productivity through commercialization in agriculture as envisaged by the APP, the Ninth Plan has prioritized development of agricultural roads in potential pocket areas that can link production with marketing and promote agribusiness. The plan has accorded priority to the construction of 1 577 km of agriculture roads in 20 *Terai* districts, 530km in 29 hill districts and 131 km in four mountain districts. Considering the potentially high cost of road construction, the plan has also targeted the construction of a 45 km ropeway to link Dailekh with Jumla. Although the plan has not set any specific targets for rural electrification under its agricultural development programme as a matter of policy, it has prioritized extending electrification to rural areas in the *Terai* where STWs are clustered and to areas in the hills and the mountains where lift irrigation has large potentials.

3.3.11 Women farmer development programme

The Ninth Plan recognizes the central role played by women in all spheres of agriculture activity and also the lack of clear-cut policies and programmes for streamlining their involvement in agriculture sector development. As a result, potential contribution of women in the development process has not been fully tapped. This recognition has been reflected in the plan through a series of women-focused programmes. The plan has envisaged leadership development among women to enable them to take lead role in the agriculture development. More specifically, it envisions increasing the effective participation of women in production, employment and income generation to enhance food security at the household level.

Accordingly, the plan aims to increase women's participation in farmers' groups formed in line with the PPP to as much as 35 percent and in capacity building training to be launched in the agriculture sector to about one-third of trainees. It encourages women farmers' groups to formulate and implement site-based income-generating activities such as the production of commercial crops and commodities, small agroprocessing enterprises, women cooperatives and rural marketing. It also seeks to strengthen the Women Farmer Development Division within the MOAC to make it capable and more effective in policy and programme design, implementation and monitoring and analysis and coordination of policies and programmes related to women's' involvement in agriculture. As a matter of policy, these programmes are to be incorporated in all the priority sectors of the APP.

3.3.12 Agricultural technology programmes

Agricultural research and extension number among the different inputs prioritized by the APP to attain high growth in the agriculture sector. Along priorities outlined by the APP and to attain high productivity, the Ninth Plan has set its own agricultural research and extension programme priorities in the following areas:

- Development and dissemination of location-specific technological packages for intensive production system covering priority foodgrain crops such as paddy, maize and wheat in areas served by year round irrigation facilities.

- Development and dissemination of location-specific technological packages for commercial production of high value commodities such as citruses, apples, seasonal and off season vegetables, apiculture, sericulture and floriculture.

- Development and dissemination of location-specific integrated soil nutrients management and integrated pests management technological packages for promoting economic fertilizer use and efficient irrigation water and soil fertility management.

- Development and dissemination of location and livestock species specific technological packages for livestock management by integrating appropriate breeds and nutrition and health programmes to achieve higher productivity of milk and meat.

- Development and dissemination of location- and species-specific technological packages for the development and commercial management of the poultry sector by integrating appropriate breeds and nutrition and health programmes for attaining higher productivity of meat and eggs.

- Instituting a system for evaluating research programmes such that the research outcome lead to low cost production technology that reduces per unit production cost and allows the commodity in question to become competitive in the market.

- Emphasizing development and dissemination of technology that are not only environmentally friendly but also easy for women to use.

The plan has categorically mentioned that the research programme for crops and commodities that are not part of the APP priority list will be prioritized based on the market potentials of the commodity. These will studied and designed to attain pre-specified results. Other programmes related to technology generation and dissemination include developing human resources, instituting proper systems to provide incentives to researchers and forging collaborative research programmes with other research organizations both within and outside the country.

3.3.13 Other programmes

As mentioned above, these programmes are meant to address the sectors that are not placed in the APP priority list but which are necessary for the overall development of the agricultural sector. The major programmes in this category are as follows:

- Production programmes: Millet, barley and other secondary crops; pulses and cash crops such as oil seeds, sugarcane, tobacco, cotton and jute.

- <u>High value crops programmes</u>: Kitchen garden development, tea and coffee.

- <u>Special vegetable production programme</u>.

- <u>Livestock development programmes</u>: Pasture development, women-focused livestock development, marginal farmer-focused livestock development, animal quarantine, rabbit farming, livestock development, credit and insurance and fisheries development.

- <u>Agricultural marketing, industry and export promotion programs</u>: Cooperative development, cooperative education and training, institutional infrastructure development and strengthening and intensive cooperative development.

- <u>Food technology, nutrition and quality control programmes</u>: Quality control and strengthening, food technology research and development, nutritional development, training and manpower development, organizational reform and monitoring and evaluation.

- <u>Agricultural research programmes</u>: Pulses, oilseeds, sugarcane, tea, jute, tobacco, spices; fruits such as mangos, bananas, pineapples, pears, peaches and plums and walnuts; vegetables; fisheries in rivers; animal management technologies for sheep, angora rabbit, pigs, yaks and *chauries*; development of wool production technology, and pasture development technology.

3.3.14 Ninth Plan development outlay for the agriculture sector

The Ninth Plan has projected a development expenditure outlay of Rs 190 billion, which is 46.2 percent higher than the planned outlay of the Eighth Plan (Table 3.16) where planned development expenditures had been distributed between the agriculture sector (26.2 percent) and the non-agriculture sector (73.8 percent). This proportion has been changed slightly in the Ninth Plan in favour of the agriculture sector, which will receive 26.8 percent.

Table 3.16: Development expenditure outlays according to the Eighth and Ninth Plans

(Rs billion)

Expenditure heading	Development expenditure		Percentage change
	Eighth Plan	Ninth Plan	
Total expenditure	130	190	46.2
Expenditure in agriculture	34	51	50.0
Agriculture		22	
Irrigation		24	
Land reform		2	
Forestry		3	
Expenditure in non-agriculture	96	139	44.8

Source: The Ninth Plan 1997-2002, NPC, HMG/N, 1998.

Planned expenditure of the Ninth Plan is 46.2 percent higher than of the Eighth plan. Planned spending for the agriculture and non-agriculture sectors increased by 50 percent and 43 percent, respectively. Subsectoral allocation is 43 percent for crops, livestock and horticulture; 47 percent for irrigation; 4 percent for land reform and 6 percent for the forestry sector.