CHAPTER- VII

THE POSSIBILITY OF AGRICULTURE DEVELOPMENT AND SUGGESTIONS RELATED

The Possibility of Agriculture Development and Suggestions Related

Pauri is primary district of villages that represent cultural, economic and social unit of the area. According to a survey, the 25% to 35% of its population has migrated to cities and metros for earning their livelihood, and rest of the population ex. 40% to 65% reside in the villages, and are involved in agriculture and related activities.

A thorough and extensive study of the area is imperative, it is because, and this area has distinct geographical and economical situation and moreover failure of the Fifth Five Year Plan. The main problems in the study of the area are un-availability of pure data regarding agricultural development and land.

There are many problems in the development of the agriculture namely; lack of availability of fertile land, modern tools and technology, means of irrigation and above all absence of proper study planning. Thus, the agriculture development has been stagnant. The agriculture productivity was effected due to above many problems in the area. It is cleared that some treatments can be suggested for the increasing of foodgrains production, and whole development of agriculture and its related activities. The new problems arise with the progress of economic development and these
problems are can on until now. Such problems are related to economic
development that is not solved. The planing for this area should be prepared
according to regional circumstances. The following treatments can be
suggested for the development of this area.

1) The Collection of Data

The proper decision-making cannot be taken without pure collection
of data. It is necessary for the development of any particular area. Such
institutes should be established for the collection of data in which has
specialist of agriculture, horticulture animal husbandry, forestry, population
and regarding regional planning. They are collected of data by survey. This
work should be done as research. The bank of primary data will be prepared
by survey that helps to understand of regional planning and its implements.

2) Increasing Pressure of Population on Agriculture Land

The population of this area is going to increase rapidly and average
size of agriculture holding is being decreased by sub-division and
fragmentation of holdings. According to census 2001, the 0.899-hectare land
per family and 0. /18 hectares land per head was available. However, this
land is decreasing due to increasing population, the population is increasing
0.387% per year and the agriculture land availability is 0.893 hectare per
family and 0.17 hectare per head in 2004 in the area of the study.

The farmers are not taking the interest in the field of agriculture due to
low productivity and lack of means of agriculture production. The maximum
part of agriculture land can be transferred in to fruit production and contour
farming. Moreover, agriculture barren land can be used for forest agriculture
and social forestry and the pressure as agriculture can be reduced. The employment can be provided to additional population in cottage and small-scale industries for the solution of this problem.

3) To Determination of Targets Under Five-Year Plans

The targets are determined by planning commission and state/central government in Indian planning system but its supply is different. The information is sent in linear system for supply. The information of targets are sent from central government to state government, state government to district level and district to block level. This work should be done to achieve the targets within fixed time in order to agriculture development should possible in the area of the study.

All the agricultural programmes are operating under above system in the area of the study. The central planning planning system are operating equal to plain areas regarding supply and determination of targets. The planners of government does not know about geographical and topographical conditions of this hill area and they make the policy according to plain areas and this policy does not implement according to targets. Therefore, they should make the policy according to geographical and topographical conditions of this hill area. Every year old, data are revised and new survey do not become. The priority is going to provide of progressive seeds, manures, irrigation under new agriculture policy to increase agriculture yield. The targets should be determined to increase agriculture production under five years plan in the hill area. These targets are to be implemented by employees at village level on the base of reality.
4) Low Productivity

The agriculture productivity is going to decrease day by day in the area of the study. There are many factors responsible for decreasing productivity namely geographical environment, dependency on monsoons, more population depends on agriculture, minimum size of holdings, lack of interest, un-sufficient non-agricultural services, backward technique of agriculture, and un-sufficient facilities of irrigation etc. It is making losable business but many farmers are working in the field of agriculture carefully. The per acre production is low in the area of the study. Removing above problems, the agriculture development may be possible. The agriculture production per nali is different according various Land Division.

First Land Division (Less than 1000 Metre Heights)

This Land Division is more productive area than other Land Division. According to survey, the farmers are taken more interest in agriculture of this Land Division. The production of paddy in this Land Division is 26 Kg per nali in un-irrigated area and 75 Kg per nali in irrigated land. In addition, the production of wheat is 48 Kg per nali in un-irrigated land and 80 Kg per nali in irrigated land. The production of manduwa is 33 Kg per nali; barley is 25 Kg per nali. Sawa 23 Kg. per nali and pulses production is 24 Kg per nali in this Land Division. This production can be increased by use of modern technique because un-irrigated land is more than irrigated land and the some part of un-irrigated can be changed in to irrigated land by the means of irrigation.
Second Land Division (1000-1500 Metre Height)

This Land Division has little hills, rivers and river vallies and there are irrigated facilities available in the low part of this Land Division. This irrigated area is used in the production of wheat; rice etc. and other foodgrains are in un-irrigated land. The production of paddy is 19 Kg per nali, wheat 29 Kg per nali, barley 23 Kg per nali, manduwa 27 Kg per nali, sawa 21 Kg per nali, and pulses production is 18 Kg per nali in un-irrigated area and the production of paddy 60 Kg per nali, and wheat is 63 Kg per nali in irrigated land. There are minimum means of irrigation and 75% land is un-irrigated that depends on monsoons in this Land Division.

Third Land Division (1500 to 2000 Metre Height)

There are so little and zigzag fields and not sufficient facilities of irrigation. This area is low productive because the fertile power of soil is low and dependency on monsoons. The production of paddy is 15 Kg per nali, wheat is 18 Kg per nali, manduwa 24 Kg per nali, sawa 19 Kg per nali barley 18 Kg per nali and pulses production is 12 Kg per nali in un-irrigated land but the production of paddy 45 Kg per nali and wheat is 52 Kg per nali in irrigated land in the area of the study.

The following treatments can be suggested to increase of agriculture production and productivity:

i) There are limited uses of quality seeds in the area of the study, therefore, use of quality seeds have to increase and the research institutes should provide seeds.
ii) There is lack of irrigation facilities. The means of irrigation should be expanded.

iii) The chemical manures do not use according to need, therefore the per acre production does not increase. Therefore, the use of chemical manure will have to increase.

iv) The modern agricultural instruments do not use in the area of the study and the production is effected therefore these instruments should be used.

v) The suitable crop-system does not apply. So this system should be used according to conditions.

vi) The crops are effected by insects and diseases therefore medicine must be used in the field of agriculture.

vii) Cultureable land is going to decrease due to erosion of land and it is converted in to barren land, so this problem should be solved.

viii) Regional farmers are poor and they cannot purchase high prices modern instruments and quality seeds. Therefore, they should be provided of modern instruments and quality seeds at suitable prices.

Above suggestions should be implemented by the government and help of NGO that agriculture development might be possible.

5) **Training and Availability of Agriculture Inputs**

Agriculture production depends on its inputs. Reforms are necessary in agriculture inputs and methods of production besides favorable institutional and organisationised structure for agriculture development.
The use of agriculture inputs should be done according to demand of crops and time so that optimum marginal productivity should increase. The productivity of labour and land increases with technical knowledge. Irrigation, quality seeds, and fertilizers are the main inputs of modern agriculture techniques but farmers should be done the use of these inputs in suitable time and methods. In addition, training must be provided about use of these inputs.

6) Lack of Irrigation Means

There is lack of means of irrigation in the area of the study and the use of chemical manure cannot be done without irrigation. The small-scale canals do the irrigated work. They are called ‘Gool’ in local language. The small ‘Gools’ are made in the bank of rivers. The means of irrigation are limited in the area of the study but these means can be increased by using rainy water and other means of irrigation. The problems of irrigation are different in various Land Division in the area of the study.

First Land Division (Less than 1000 Metre Height)

According to primary survey, this land division is more irrigated than other Land Division, this area can be increased by the help of government, and it has no deficiency of water. Mainly rice and wheat area is irrigated, the 24.03% area of rice is irrigated and 19.32% wheat area is irrigated in this Land Division.
Second Land Division (1000 – 1500 Metre Heights)

This land division is low irrigated area in comparison of first Land Division but this area can be increased by using small river water. The irrigated area of rice is 14.31% and wheat for 11.435% in this Land Division.

Third Land Division (1500 – 2000 Metre Heights)

It is maximum un-irrigated area and there are surplus of small-scale fields. The irrigated land for rice is 9.15% and wheat for 6.34% in this Land Division.

Thus, the use of fertilizers can be increased by using irrigation means and agriculture production can be increased.

7) Less use of Fertilizers

Mainly natural manure is used in the area of the study. This manure received from cow, bulls, goad, sheeps and Bedfellow etc. In addition, the minimum quantity of chemical manure is used in this area. The natural and chemical fertilizers are used according to Land Division:

First Land Division (Less than 1000 Metre Height)

This area is more productive than other areas and therefore farmers take interest in agriculture. The use chemical and natural manures are used more in this Land Division because irrigation is more than other Land Division. The average use of natural manure is 180 Kg per nali and chemical manure is 0.5162 Kg. per nali under Khareef. In addition, the average use of natural manure is 250 Kg. per nali and artificial manure is 0.642 Kg. per nali
in the first Land Division. The use of chemical and natural manure should be increased so that the agriculture productivity should increase.

**Second Land Division (1000 – 1500 Metre Heights)**

This area is more productive than third Land Division. The average use of natural manure is 150 Kg per nali, chemical manure is 0.3096 Kg. per nali under Khareef but the average use of natural manure is 225 Kg. per nali, and use of chemical manure is 0.423 Kg per nali under Rave in the area of the study. This use of manure is low, and production is affected therefore the use of manure will have to increase in order to agriculture production increases.

**Third Land Division (1500 – 2000 Metre Heights)**

This is low productive area and there are maximum zigzag fields in the area of the study. The use of both chemical and natural manure is low. The average use of natural manure is 120 Kg. per nali and chemical manure is 0.2064 Kg per nali under Khareef but the average use of natural manure is 200 Kg. per nali and chemical manure is 0.423 Kg. per nali and Rave.

The average use of natural manure is 150 Kg. per nali, chemical manure is 0.344 Kg per nali under Khareef, and the use of natural manure is 225 Kg per nali and chemical manure 0.459 Kg per nali under Ravi in the area of the study. The average use of manure should be increased so that per nali production should increase.

The average distance of fertilizers centres from villages is 5 Kg in the area of the study. The manure distribution is a big problem at regional level. What should be the ratio of chemical and natural manure and how should the
use of this manure? At this time, guidelines are not provided regarding manures distribution. Therefore, general awareness should be provided about environment, research, development, and practical conditions of this area. So agriculture development can be improved by technical knowledge of agriculture, span of education and fertilizers in agriculture. In addition, chemical manure can be used in un-irrigated area but training should be given to farmers, how would the use of chemical manures in un-irrigated land? Thus, method of use of chemical manures will be increased by training and per nali production increases.

In the area of the study, the use of chemical manures cannot be suitable until analysis and chemical test of soil will not be done. Therefore, first, soil should be tested and knowledge should be provided about soil and chemical factors to farmers.

8) The Supply of Progressive Seeds

The use of quality seeds is necessary for the agriculture development in the area of the study. All the means of production will be wasted without quality seeds. There is lack of quality seeds and farmers sow 100%, normal seeds of his own fields. Maximum farmers have not knowledge about quality seeds. The average distance of seed centre should be established at village level according to survey.

In the area of the study, the seed centres are situated in the head quarter and other main markets whereas maximum agriculture work is done in backward sectors and they have to face many problems to achieve of quality seeds. In addition, many farmers do not use of quality seeds from
above problems. Therefore seed centres should be established in the nearest of backward villages.

9) Consolidation of Holdings

The main problem of agriculture development is sub-division and fragmentation of holdings. The land of hill agriculture is different on the base of productivity, shape and size, the agriculture farmers are not interested regarding consolidation of holdings because how should distribute of such various fields. In my opinion, productivity should be the based for holdings. The allotment of holding of land must be according to production. Seeing the regional problems of agriculture in the area of the study, the state government should make a suitable law for consolidation of holdings.

The average size of holdings in the area of the study is 2.19 nali according to primary survey while it is different according to topographical conditions. This size of holding is being gone to decrease rapidly by the problem of sub-division and fragmentation of holdings. The following profiles will be achieved by consolidation of holdings:

i) The farmers will get a maximum part of land in a place for agriculture work and they take interest in agriculture.

ii) They will make new plans for land because their labour is fixed after consolidation of holdings.

iii) They can do commercialization of their agriculture.

iv) The farmers will use of quality seeds as per choice.

v) Non-agriculture land will be converted into cultureable land and productivity increases.
vi) Care of land will be easy because a large part of land situated in a place.

vii) The problems of grass can be solved and the business of animal husbandry can be increased.

viii) The problems of revenue account can be solved as land records and distribution of land etc.

ix) The regional land conservation problem can be solved.

x) It is saved of time by consolidation of holdings because the distance of one field to another is more.

xi) Generally, the miss used of means of financial will be lest.

In my opinion, the suitable steps should be taken by the state government for the consolidation of holdings and consolidation act is to be prepared.

10) **Reforms and Formation of Agricultural Instruments**

According to regional conditions, the agricultural instruments should be prepared because these traditional instruments take more time in agricultural work. Therefore, reforms in these instruments are necessary in order to time and labour should save. The gain of modern registration gets only to plain regions. In addition, there were no efforts in agriculture technique in the area of the study. The research centres should be established for agriculture development and its instruments. Training is necessary for back smith. The farmers have to use of modern instruments for the agriculture development. Because time will be saved and rest time invest in
other development functions. The maximum instrumental work is done by blacksmith; they get grain or money as remuneration.

11) **Training for Women**

Women in the area of the study do maximum piece of agricultural work, but they do not provide training and the agriculture department does not take the interest in this work. This department as a statue and there are no facilities of agriculture education in hill schools and colleges of Uttaranchal. Agriculture production can be increased by women but they have to take training about agriculture, home management, care of child, balance food, expenditure of family, and fruit protection etc. Moreover, training can be provided for animal husbandry, polity farm, to make of manure and its uses, forestry, bees, quality seeds, method of sowing, loan for agriculture instruments, crops safety from insects, grain care, storage and sales also so that the agriculture development can be possible. Women have natural labour powers. The average 80% women are engaged in agricultural work and its related business in the various Land Division in the area of the study.

The training should be provided to women regarding land conservation and to know losses of land erosion and importance of trees. The suggestions should be implemented because soil is the source of various types assets. It is a base for agriculture. The land erosion is a serious problem now a day. It is not only local problem of hill areas but also is a national and international problem. This problem can be solved by international co-operation. Therefore, training should be provided to women classes about land erosion.
12) **Reforms in Revenue Accounts**

According to survey of this area, found out that the data and number of holdings were doubtful in the revenue accounts. The accounts are not amended in every year. Enquiry and reforms in accounts should be done in a particular time.

According to Kumaun Jamidari Act 1964, the land had been measured in 1964. After this, there was no measurement of accounts while, some barren land changed into cultureable land and some cultureable land changed into barren land. However, this was not actual recorded in the revenue accounts. The holdings are divided among the brothers but this is not also recorded according to that ratio in the revenue accounts. Therefore, the errors should be removed and reforms are to be done in these doubtful accounts. It is cleared by survey, that the number and area of agriculture holdings cannot be found out by such revenue accounts until families division in villages are not feeded in Lokhpal accounts. Therefore, reforms in revenue accounts are very necessary for the development of agriculture. Total records of land should be printed in these accounts.

Therefore, the errors in these accounts are responsible for slow development of agriculture and its development may be possible after removing the errors from these accounts.

13) **Research and Development Centre**

There is lack of research and development centres in the area of the study. These centres are provided to help for the solution of regional problems. The suitable place for the development of such centres is
university and colleges. The problems of agriculture development can be solved by regional institutes that can provide knowledge about regional agriculture of irrigated and non-irrigated areas. Most priority should be given to irrigation by rainwater. Approximately 15% un-irrigated land can be changed into irrigated land by the help of research centres.

The rain irrigated research institutes should be expanded according to climate and land size of every Land Division. These institutes are to be small and middle size for this work:

i) The aims of the research, doing the agriculture research in regional un-irrigated Land Divisions, to increase per hectare productivity of rural farmers.

ii) Research has been done in various crops namely paddy, maize, manduwa, wheat etc, and this research gain should be provided to rural farmers for un-irrigated areas.

iii) The facilities of storage and collection of local quality seeds should be provided at the level of Block/Goan Panchayat/village.

iv) To selection and span of local quality seeds on the base of research.

v) The condition of regional climate factors rain, temperature, humidity etc. can be fond out by research and hill agriculture can be saved by some treatments.

vi) According to regional conditions, natural and chemical manures should be used after research and per hectare production can be increased.
vii) The collection of agriculture related information should be achieved by research as quantity of water, use of fertilizers, seeds etc.

viii) The research work should be done on land conservation and cantor farming by collection of statistical information.

14) Priority to Main Plans

More priority should be given to productive programmes as economic facilities, drinking water, health and reforms in environment etc. for the fast development of the area of the study. Rural development programmes is to be operated namely national rural employment programme, horticulture, agriculture development, soil conservation and management of forests on the scientific based, animal husbandry, development small-scale and cottage industries and development of schedule casts and other backward classes etc. for the rural development.

The valuation of planning structure should be done on the base of priority after seeing need and nature of the study of the area.

15) Facilities of Sales and Distribution

Marketing plays a pivotal role in the agrarian economy of any region. A market –oriented economy is dynamic one and is characterized by steady growth and expansion of markets. It is, therefore, imperative that along with the introduction in marketing technology is also equally important, in case of perishable agricultural, horticultural, and livestock products, the role of effective marketing infrastructure is even more important. The benefits of
improved cultural practices will not be fully harnessed unless the agrarian marketing structure is simultaneously improved.

These are not suitable facilities for sales and distribution of agriculture products. The markets are situated at long distance. By this problem, farmers are not produced of agriculture products for sales. The farmers of this area cannot take the benefit of surplus of agricultural products due to lack of market facilities. Therefore, they are not taking the interest in surplus yield.

Agriculture products exchange centres should be established by related department that might be succeed for the help of the food grain production, vegetables, oil seeds, pulses, milk and its products exchange. Thus, market can be developed by this scheme and economic development of the area may be possible.

**Conclusion**

Ecological balance of an area must be taken in to consideration while commencing the economic development programmes in the area. Ecology plays vital role in the field of agriculture. The geographical and topographical condition of the hill areas of Uttaranchal is quite different from that of the plain area. However, there is one factor in common that is the area of agriculture field cannot be expanded or increased, it can be treated and make more rich and fertile. Presently, in the hills, the major portion of land under the cultivation includes such area that is neither much fertile nor economic but only prevents the soil erosion. The per capita small land share, and fragmentation and division of the land holdings are a great
problem in this area. Not all the fields are in consolidation. These are rather scattered and located in far-flung Land Divisions.

The next challenge for the economic planning is surplus un-economic animals and increasing population. The useless animals are exploitations time and farmers resources. They are un-economic for the enhancement of agriculture yield and economy, improvement in means and method is must, for that there should be change in instruments and crop cycle and its combination.

The prime crops of the land are manduwa and sawa and alike which are not economically beneficial. It is necessary to replace them with the cash crops, which can increase the income of the farmers.

It is a fact that with the present state of technology and given topography, it is impossible to irrigate the entire arable land. The policy of irrigation development must have twin objectives viz optimum utilization of existing facilities and secondly to tape the irrigation potential to the maximum. For the later objective, constant efforts are needed to make irrigation technology economic and viable to the area.

The topography of the area has restricted the applicability of canals and Gools. Lift irrigation, gravity flow, rainwater harvesting and tanks (Hozes) are the feasible means of irrigation. The staggering cost of the farmers two precludes their universal applicability. The later can be used only as supplementary method. The consumption of farmer two is beyond the capacity of individual cultivator. Therefore, these two should be left exclusively with government departments. However, with technical and
financial assistance, the farmer can be persuaded to construct his or her own hozes. Detail techno-economic survey is needed to specify the locations of gravity flow and lift irrigation schemes. However, it is worthwhile to mention that the cheap and sufficient availability of electricity is the pre-requisite of extending and improving irrigation facility.

Making has also been a major economic determinant. The bustling agricultural activities have been mostly in the interior areas, which are devoid of means of transport and communication. Therefore, the farmers are not able to turn their surplus of agro-production in to economical gain.

Come to the close, it is a well-known fact that the economic potential of the hills of the Himalayan region has yet to be realized and utilized. Uttaranchal being a Himalayan state deserves much attention in this regard. The Pauri district, which constitutes major portion of the population of Uttaranchal and holds fourth ranking in its land share, is still legging behind in its contribution in total agriculture production.

These are so many potent reasons, which have caused low productivity in the district. Some of them are as fragmented of economic holdings, non-fertile soil, un-sufficient agricultural inputs, poverty, lack of proper means of agriculture and modern technology and above all absence of appropriate planning.

The above stated problems are so complex and diversified that a multifaceted and composite planning is required to deal, at on hand, with improving quality of seeds, means and methods of irrigation and cultivation, at the other hand provide to the farmers with proper education and training.
Besides simultaneous efforts should also be made to provide storage and marketing facilities so that economic gains of the farmers may lead to the overall economic growth of the district.

**GLOSSARY**

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<th>S. No.</th>
<th>English Name</th>
<th>Local Name</th>
<th>Botanical Name</th>
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<tbody>
<tr>
<td>1.</td>
<td>Paddy</td>
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<td>Barley</td>
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