

## Square Peg in Round Hole: Agriculture Development Strategy in Nepal

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### Abstract

The mountains harbor highly fragmented and topographically diverse landscape, making it difficult to adopt high input, mechanized, large scale agriculture. Increasingly the agriculture in mountains is witnessing its downfall across the globe. Local food system, farmers' income and stability of ecosystems are threatened. Farmers are under pressure to adapt their system of cultivation faster to cope with changing climate.

Finely tuned to micro-climates, Nepal's mountain agro-systems have thrived for thousands of years sustaining bio-diversity and recycling of resources to an optimum. Augmented with the changes in lifestyle and driven by quick-return high external input, policies that are generally devised at state level without adequate consideration to specific agro-ecological conditions is the crux of the problem. Arid Karnali region is one of the victims of such a drive.

This paper illustrates how such regions have been ignored in the process of policy formulation taking the country's latest Agriculture Development Strategy (2015-2035) in reference. It is observed that largely the Strategy is not informed by evidences from the ground. Though the Strategy sought for a radical change in agricultural sector recognizing multiplicity of complex institutions, substantial infrastructure, mechanization, flow of external resource for productivity, the Strategy paid little attention to livelihood strategies and food security in the mountains. the proposed high external-input agriculture approach does offer neither dietary needs of local the population nor it promotes crops that have relative advantage over 'main stream crops'.

The Adaptive Agro-ecological Approach that fits best to social, cultural and ecological systems of farming populations could be the viable and sustainable solutions in addressing the changing climate and food insecurity in future for both - the region and the country at large. It recommends the formulation of policies in such a manner that allows and encourages different agro-ecological regions to formulate strategies of their own.

**Keywords:** Agriculture Policy; Arid Agriculture; Mountain Agriculture; Agro-Ecology

### Introduction

Based on the desk study of the available documents related to Agriculture Development Strategy (hereafter ADS), this paper critically analyses its contents and attempts to raise issues of Nepal's agriculture sector referring the cases of agriculture in Karnali region. Taking into consideration of the different dimensions of Nepal's agriculture, it firstly presents the context of the agriculture development in Nepal and then presents the review on ADS and likely consequences of its implementation in reference with specific characters of the mountain ecology. This paper then presents examples of appropriate agriculture systems and practices and suggests frameworks and perspectives for realistic approach to agriculture development in Nepal.

### Changing context of Nepal's Agro-economy

Nepal is well known for its agro ecological biodiversity. The agriculture systems of Nepal have thrived for thousands of years sustaining bio-diversity and recycling of resources to an optimum. Such systems are finely tuned to adapt the socio-economic as well as environmental

micro-climates following the principles of social acceptability, economic viability and environmental sustainability. However, these systems have been co-opted with the influence of mainstream high input industrial agriculture which is not appropriate in Nepali context.

In Nepal, farmers are increasingly encouraging their younger family members to leave their villages in search for livelihoods other than from agriculture as it is no longer possible to earn a living. And those remained in the villages also do not have commitment on farming, they are taking it as there is no choice to leave it therefore they cannot leave it easily. Indeed, the large-scale exodus from villages is evidence that farming is no longer an attractive profession. Today farming is symbolized with hard work that yields low returns. Because of the lack of employment opportunities in the country, at the same time massive opportunities aroused in the middle east and other countries, the youth scrambles to go for wage work, they do so it with high expectations. Statistics shows that a large majority of men and a number of women between the ages 15-45 have left their homes in the village for the city and foreign lands in search of employment. According to the Department of Foreign Employment in 2015 every day between 1,200 and 1,500 youths went abroad for work totaling 4 million excluding youths who have gone abroad illegally and working in India [1].

Another, important fallout of this labour migration is that Nepali agricultural labour is being increasingly feminized. Burden of both farming and household reproductive roles including child care, are now has fallen on the shoulders of women [2]. These days in many villages across the country, it is primarily the elderly, disabled and other marginalised people lacking resources to pursue other forms of livelihood, who remain. Whether it is in the plains, hills or mountains, attraction towards agriculture is declining, although, the main source of income for the majority of Nepalese still remains in agriculture [3,4].

A vast majority of small farmers who lack resources to pursue an alternative means of livelihood are forced to work in the agriculture fields. The situation of these farmers highlights a critical disconnect between land ownership and farming professions in Nepal. Significantly, many of those engaged in farm work do not own sufficient land to live on while, at the same time, many people who do not farm for a living continue to own large tracts of arable land. Still majority of the (around 80%) who are actively farming own only around 20% of land and those around 20% who own almost 80% lands are far from farming [5]. This contradiction raises the question – who is a farmer? Moreover, much of the country's productive land is under the inherence of organised real estate agents who make a large profit from the buying and selling land. The lack of legal provisions mandating that the owners of arable land maintain it under active production is one reason why there is a growing tendency to leave land fallow [4]. Since the prices of land near the cities are skyrocketing, it is getting difficult for farmers to buy or rent arable land. In addition, making a living by tilling the land are under economic pressure as the agriculture inputs are getting more and more expensive. This is also a factor leading the land to be left fallow.

Another important shift is that the linkage between local food systems and food culture is broken. Across the country, due in large part to the influence of the market economy, food culture and the production of food crops is undergoing rapid change [4]. For example, despite the presence of a wide variety of food crops grown in the country, Nepali's staple food is rice. The growing popularity of rice has influenced our food culture a great deal. For example, in the Karnali region of Nepal rice is airlifted for last 40 years which is these days called 'flying rice', the traditional food crops of the region, other than rice, are neglected. This is true for the whole country where rice and packed food especially ready-to-eat noodles has displaced local foods. The tendency of the general public is that they feel poor if have to eat anything other than rice for their staple.

The changes in Nepali agriculture are augmented with the changes in lifestyle and driven by quick-return high external input, policies that are generally devised at state level without adequate consideration to specific agro-ecological conditions. It is the crux of the problem of agriculture in Nepal in general. And in specific, arid and semi-arid Karnali region is one of the victims of such a drive. At most all the agriculturists do not have the knowledge about the arid and semi arid specificity of the Karnali region.

The flip side of modern agriculture is slowly becoming evident everywhere. In the name of the development of green revolution agriculture, an extensive use of chemical fertilizers, pesticides, and self-terminating hybrid seeds has had a detrimental effect on the environment and human health. The unchecked and haphazard use of chemical fertilisers has decreased the fertility of the soil as well as increased the cost of production. By making the farmer dependent on external resources, this so called green revolution agriculture have brought about an imbalance in the natural ecosystem of water, land and forest. As a result, both sustainable agriculture and forest resource management are facing crisis.

Today, competition for arable farmland and agricultural resources has reached unprecedented levels. World population stands at 7 billion today, from a mere 1 billion just two centuries ago. In addition to this growth of population livestock have increasingly joined the competition. Meanwhile, after the oil crisis of 1970s, machines that run on bio-fuel have also become consumers of food grains. The exorbitant price increment of food grain is one of its results. Every day the globe's living resources are depleting. The skyrocketing prices of food and agricultural commodities combined with global recession and unstable markets are increasing food insecurity in previously unimaginable ways. When we take climate change into consideration as well, the situation gets alarming.

### **Agriculture development strategy: a critical review**

A precursor of the ADS, Agriculture perspective plan (1995-2015) was prepared in 1993-94 with the financial support of the Asian Development Bank, World Bank and Food and Agriculture Organization (FAO). Agriculture Project Services (APROSC)<sup>1</sup> and John Mellor Associates<sup>2</sup> prepared this plan. In order to establish agriculture as the backbone of the national economy, the Plan had set the following specific objectives:

- To accelerate the growth rate in agriculture through boosting agricultural productivity;
- To alleviate poverty and achieve significant improvement in the standard of living through accelerated growth and expanded employment opportunities;
- To transform Nepal's predominantly subsistence based agriculture into commercial agriculture;
- To expand opportunities in agriculture development through overall economic transformation; and
- To identify immediate, short-term, medium-term and long-term strategies for implementation and to provide clear guideline for preparing periodic programs and plans.

Divided into five sections, the Plan is based on 26 technical reports prepared by 21 agriculture experts. The sections are: agriculture strategy; agriculture input priorities (irrigation, fertilizer, technology, roads and energy development); production priorities (animal husbandry and poultry, high value agriculture produce, commercial agriculture promotion and forest management); sectors that agriculture impacts (poverty, food security and environment); implementation (investment, agriculture policy and institution development). In order to implement the Plan, under the leadership of national planning commission a support committee, the Department of Agricultural Roads, Agriculture Development Bank, Agriculture Inputs Corporation and Agricultural Research Council were designated as the main implementing partners.

According to the preliminary evaluation by the ADS preparation team, the Plan has mixed outcomes [6]. Positively, it was a first comprehensive plan of the agriculture development in the country. On the negative side, the plan could not address issues related to

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<sup>1</sup>APROSC (Agriculture Project Services): Established in 1975 APROSC is a semi-government organisation that conducts research in Nepal's agriculture and rural development.

<sup>2</sup>John Mellor Associates is a Washington DC, USA-based consultancy. It provides consultancy services on the strategy development and implementation on institutional development in low and middle income countries.

improving food security, improving access to resources by those with poor living standards, providing food and nutrition security to children, and to addressing issues of women and excluded communities [7].

Although the review points to cliché terms such as the lack of investment, lack of coordination, cutbacks on subsidies, insufficient attention to the legal regime as the reasons behind the failure of the APP, it does not mention the processes in its preparation and participation as well as commitment in its implementation which seem to be the root to the problems. The conclusion of the review has mistaken in the analysis of the reasons behind the failure of the APP and draws the critical lessons to be learned from it. In fact, it was prepared by the close allies of the donors who could not reflect the reality of agriculture from broader perspective. There were no wider debates, discussions and reviews either on the framework of agriculture development nor on the strategy needed to be adopted for its implementation.

The failure of the APP implementation was in-appropriate framework of the plan. It was prepared without a wide consultation on the basic framework of Nepal's agriculture development among relevant stakeholders. However, the well accepted failure of implementation was laid in the lack of ownership of the Plan. Lack of follow up was not only a problem of agriculture ministry, lack of commitment from donors in investment, despite them proposing a plan with high level of external input was another important reason for its failure. This shows that donors are more interested in producing high sounding policy documents and are less committed to supporting their implementation.

### The ADS process

In order to comprehend the core ideas in the ADS, it is also important to examine the policy-making process, the approach of consultation and the role of the different stakeholders. ADS process was mainly led by consultant expert within the guided framework of influential donors. It is noteworthy to mention here, at the beginning of the policy process, farmer's representatives were not involved in it. Only after the pressure from farmer's network and civil society groups, the representative from National Farmers' Coalition, a network of the political party affiliated sister organizations and farmer's groups were included in the process of ADS.

In general, Nepal's policy making process is not adequately inclusiveness and participatory. Traditionally, many policy documents were prepared under the initiative of donors by consultants where government officials presented as mere witness. As a result, nobody owns such documents and as soon as the formulation is over, it is stored in the ministry's shelves. The present ADS is also in same line. Though government claims, it is being prepared under a government decisions but the process of its preparation was confined to a cabal of donors and consultants.

Meaningful participation of the general public in policy making is an underlying spirit of a democracy. Sadly, despite high rhetoric the state has not shown any interest in increasing the public's participation in the policy-making process. While government bureaucrats and consultants - the traditional policy shapers/makers- appear at ease no to consult the public. The political leadership is neither aware of the process nor concerned about it.

### Content of ADS

The ADS, prepared without a critical review and analysis of the reasons behind the failure of the APP, envisions "A self-reliant, sustainable, competitive, and inclusive agricultural sector that drives economic growth, and contributes to improved livelihoods and food and nutrition security leading to food sovereignty".

It seems that the proposed Strategy has been prepared based on the assumptions of free market economy and commercialization of agriculture and without an objective analysis of Nepal's socio-economic context and the needs for an agriculture transformation in the country. Taking agriculture purely a technical and economic enterprise and characterizing Nepal's farmers as mere agricultural labours,

the framework of the ADS<sup>3</sup> insists that development of Nepal's agriculture sector is only possible by attracting multi-national financial institutions. This also seeks to establish that the direct foreign investment is essential for Nepal's agriculture development.

Total factor Productivity (TFP) has been taken as a measure of agriculture development, this framework is not suitable to address the complexities of Nepal's agriculture sector. Of the four strategic pillars – good governance, productivity, commercialization and competitiveness, other than good governance, the other pillars geared towards the promotion of commercial agriculture based on high investments. Such highly ambitious high input agriculture is not only impractical; possibility of its implementation looks remote. It does not consider the ground reality of structural as well as technical feasibility as well as Nepal's agro-ecology, culture and socio-economic diversity.

The approach of agriculture development is based on the Eurocentric industrial and market driven economy. Although the ADS feebly mentions factors such as the uniqueness of Nepal's agricultural bio-diversity and the potential diversity of agricultural products; the food security situation, the influence of neighboring countries' agriculture on Nepal's agriculture, land use, health and nutrition, suitable agriculture technology and services and investment, there is an overall lack of analytical coherence in addressing these critical issues. For example, in this document, the Food Security and Nutrition Plan [8] is presented as one of the supplementary add-ins of the strategy which has raised important aspects related to food security, but does not fit into the ADS as a whole.

Nepal's agriculture should be based on diverse socio-cultural as well as ecological realities [9-11]. The ADS approach is difficult to implement other than in plains even that discounting a large gap between those landed and landless. Further, there are historical, social and cultural complexities that inhibit the development of large-scale modern agriculture in Terai [12,13]. Second, given Nepal's agro-ecology, intensive input and mechanization are not feasible. As a result, Nepal's agriculture products cannot compete with large scale mass production of neighboring countries. India and China sustained by large scale inputs, heavy mechanization and augmented with subsidies. For example, apples imported from China are cheaper than the apples grown in Karnali and on other mountain areas because of these gaps.

All this suggests that Nepal's agriculture can only survive with a strategy of promoting agricultural products that has default comparative advantage rather than highly competitive products. For that Agro-ecological niches should be identified then, the production of local food should be emphasized and the products with a comparative advantage should be given priority. There are dozens of agro-ecological niches in Nepal. On the basis of the rainfall pattern alone, we can find areas with high rainfall, arid and semi-arid areas in the mountains, in the hills and in the plains. However, promoting agriculture at the local level with due consideration to such diversity is not given due consideration.

Elsewhere in the world where agriculture based on high external inputs has added to the problems of human health and environment and destroyed the agricultural economy [14-16]. The cases of suicides by farmers in India in the recent past are next door examples of such phenomena. In a period of 10 years, more than 200,000 farmers committed suicide because they could not pay back the loans they took to buy fertilizers, pesticides and other agricultural inputs<sup>4</sup>. The ADS put forward at a time when there is worldwide emphasis on farmer-friendly agro-ecological agriculture system to safeguard the future of agriculture in small and poor countries, cannot be expected to benefit farmers if based high input modern techniques.

Agriculture should increase both food production and the farmer's income. The transformation of agriculture is almost impossible if it is taken only as a technological means to increase income. An agricultural development framework prepared without a meticulous

<sup>3</sup>Based on the technical model of Total Factor Productivity –TFP – in turn based on principle of marginal productivity.

<sup>4</sup>For additional information <http://www.voltairenet.org/article159305.html>

evaluation of the failure of the APP cannot provide perspectives for the transformation of Nepal's agriculture. Yet this is exactly what is being done with the ADS. A plan prepared without addressing important issues like land reforms, land use, development of appropriate technology and securing the state's investment in the agriculture sector – few of the main problems facing the country's agriculture sector – cannot be successfully implemented. Looked at from this point of view, the ADS is no more than an exercise of the donors and consultants that enjoy the act of making policies.

### The civic perspective of ADS

The strategic roadmap to be taken for Nepal's development depends on the way its agriculture is understood. As mentioned above, this viewpoint must be based on an assessment of the overall situation of the country. The preparation of the framework and strategy of Nepal's agriculture development must rise above narrow agriculture sector confinement and encompass the country's land use policies as well as its social, economic, political and cultural landscape. However, there lack coherent mechanism to effectively coordinate and bring synergy between sectors. Therefore agriculture development should not be made a sectoral strategy of the Ministry of Agriculture but be presented as an agricultural development plan of the state. To do so it is equally important to learn from the positive experiences of other countries in agriculture development and adapt as appropriate.

An agriculture system pushed by a large-scale investment, ignoring the problems brought about by the green revolution agriculture<sup>5</sup>, may benefit few investors and entrepreneurs but it will be detrimental to small farmers and the whole agriculture sector. The agriculture system depended on high external inputs will have a negative impact on human as well as soil health.

Nepal's Food production system should be viewed from the agro-ecological diversity across the three broad eco-regions. Bio-diversity, existing agro-biodiversity in particular of the regions should be taken as an opportunity rather than a problem. It is necessary to prepare a action plan based on agro-ecological features for the promotion of cooperative movement, professionalism and self-sufficiency. Another, In Nepal's context it is not practical to prepare singular model of agricultural plan. Considering the country's diversity, the Strategy for agriculture development must be based on the basis of biological regionalism.

Widespread hunger and malnutrition across Nepal is an indication of the lack of access to food grains. This deficiency needs to be immediately addressed. However, a plan that propagates a commercial agriculture system cannot address the problem of food and nutrition insecurity that millions of farmers are facing today. Therefore, an agriculture strategy must be geared towards prioritizing the agriculture for food and substitution for imports through the products of comparative advantage.

In Nepal, where a majority is small farmers, the entrepreneurship of the farmers, value chain development and self-sufficient agriculture can be chosen with institutional development of agricultural cooperatives. A production-oriented agricultural system based on cooperative movement will help in making sustainable livelihoods in Nepal with its agriculture economy based on small scale farms. The state's agriculture policy should be oriented towards strengthening local economies by making farmers self-sufficient production and agriculture skills.

While on the one hand it is not possible to prepare a practical strategy without considering the cost of production, farmer's ability to invest and the available resources that the state can invest in agriculture, on the other hand, centrally-prepared single plan which fails to consider local economy, local control and ownership cannot be implemented.

The question of local control and ownership is related to issues of governance and agriculture product marketing. In a market-oriented economy it is not possible to make a social enterprise such as agriculture attractive without local marketing mechanisms to reduce risks. Thus, the role and scope of the state and the market in the development of the agriculture sector should be clearly devised.

<sup>5</sup>Agriculture system based on high external resources and hybrid seed that became in the 1960s in India.

Besides, food production and food security should be viewed in terms of the local context and culture. It is important that the promotion of a production system suitable to the local agro-ecology will ensure continuous production despite the uncertainty posed by climate change. It is important that attention is paid in research on varieties and breeding local traditional crops and animal breeds for their improvement. It is necessary to assess the impact of climate change can have on these crops and the ways of adaptation. Diversity over monoculture, annual over perennial crops, local over introduced and integrated farming methods are the main bases for reducing such risks. At the same time, climate change is bringing more positive opportunities in some areas which need to be fully realised and adapt [18-29].

### Long-term vision of the ADS

Building on the principles of basic sustainability, a model of sustainable agriculture system based on local resources and technology will be prepared. Also, while developing the model social features like geo-political situation, bio-diversity, food culture and food and nutrition security will be reviewed and, with the goal of ensuring food sovereignty, emphasis will be given to prioritizing agriculture for food and commercial production of agricultural products with comparative advantage.

This vision would follow the objectives to;

- Increase the production of basic foodstuff at the local level on the basis of diversity;
- Increase production of products with comparative advantage and promote their export;
- Extend agriculture education and technology that addresses sustainable environment, bio-diversity and practical problems of the majority of the farmers;
- Protect the benefits of the majority, especially small farmers, and develop and strengthen a farmer-friendly agriculture services mechanism.

### Key strategies

- Redistribute land and other productive natural resources and for this prepare an effective mechanism for necessary policy on decision-making and implementation such that the area of agricultural land increases and private ownership is maintained. Prepare a policy to ensure that arable land does not remain fallow and especially discourage the use of grain production land for other purposes;
- Identify Nepal's agro-ecological zones/regions, define their special features and, on this basis, prepare local agriculture plans and implement them effectively. Prepare an ecological zone-wise list of crops suitable for import substitution and export and make specific crop-wise arrangements for their production, processing and marketing;
- Increase the production of crops and animals that require simple technology and low investment while emphasizing import substitution. At the same time emphasize development of small and medium technologies that decrease the work load of small farmers, especially of women;
- Prepare and manage a mechanism to support effective coordination between agricultural education based on local and traditional knowledge, research and extension. Modify agriculture education as a system based on localized agriculture knowledge, skills and concepts and develop them to prepare necessary and suitable agriculture manpower. Emphasize research on technical subjects like integrated agricultural systems, the development of agro-forestry systems, seed improvement and local crop and animal breeding systems, soil quality improvement, organic fertilizer, integrated disease and pest control as well as research on, and implementation of, veterinary management and its production increase system and inter-cropping and rotation cropping systems;
- Study the concrete effects of climate change for the farmer in Nepal and develop suitable technologies to counter the effects and extend such technologies;

- Promote multi crop rather than single crop, multi-year crop rather than single-year crop, local crop and local animals. Generally emphasize improved livestock and improved crop varieties :local crops, vegetables and animals, multi-year crops and fruits, crops and animals that require low maintenance and substituting import of agriculture products;
- Encourage financial institutions to invest more in agriculture and discourage investment on other uses of agricultural land;
- Improve an agriculture-forest interface capable of both rehabilitating degraded forest areas and encouraging landless and marginalised communities to utilise them. Keeping in mind the harm that may be caused to natural environment and public health, as far as possible adopt agriculture system and programmes that require little external investment;
- Develop feedback processes in which farmer representatives are present at every level of the structure of agriculture;
- Include in the appropriate curriculum at the school level content about the special features of Nepal's agriculture, possibilities and the importance of knowledge on agriculture production as well on the subject of food;
- Manage effectively post-harvest production processes; processing, storage and local market mechanisms to maximize farmer's return from the cultivation.

### Conclusion

While considering the framework of ADS, it is important to note that a transformation of Nepali agriculture, except in the case of the plains of Nepal's Terai, is not possible through the development of an agriculture system based on so-called green revolution and large-scale investment. Indeed, with about a third of the land in Karnali is in arid agriculture systems, 87 percent located in the hills and mountains with the fragmented small land holdings of small farmers, to sale the dream of a high investment intense agriculture system is only burdening Nepal and Nepal's farmers with loans and being dependent on others.

There is a need for sufficient debate on the kind of framework suitable for Nepal's agriculture development. Only with the participation of different schools of thought in such a debate contributing to a critical, objective analysis can a credible model of agriculture strategy be identified.

Learning from the positive attempts of the past, Nepal's policy makers need to think about an agriculture system based on minimal external resources rather than a model of farming based on high levels of external resources. Farmers must be provided with an idea of how to produce more food in a sustainable way given the institutional structures, technology market and limited arable land. There is a need to create agriculture policy and practical plans for research and extension that are suitable to the present time.

What can be saved by developing an agriculture system based on conservation and adopting the concept of integrated resource management in Nepal's agriculture development? The development of such an agriculture system should be based on a principle of local economy that emphasizes conservation of resources and overall development of the quality of life. Only such a system will support an agricultural economy based on natural and social values. This will consider bio-diversity, local communities' and families' economies, healthy business practices and communities' fundamental rights as well as promote agriculture, land, forest and food rights and support the sustainable management of situational systems.

There is no doubt that the agriculture sector is huge and extensive; as such, assessing social and technical questions related to it and proposing alternatives is a challenging task. These proposals only indicate a possible direction for Nepal's agriculture and have been presented with the expectation that they inspire contemplation and more preliminary debate and discussion towards a practical agriculture strategy for the future of Nepal's agriculture.

This is intended not for the sake of any theoretical perspective or thought but rather for the sake of the Nepali farmer and Nepal's agriculture, environment and sustainability. We suggest that the Eurocentric agriculture approach is not suitable for Nepal. The mountain agriculture with its specific characteristics must be treated differently than of the plains. Adaptive Agro-ecological Approach (AAA) that best fits with social, cultural and ecological systems can only be the viable and sustainable solutions to addressing climate change and food insecurity challenges of primarily Mountain Agriculture System of Nepal. It recommends the formulation of policies in such a manner that allows and encourages different agro-ecological regions to formulate strategies of their own.

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