

Sustainable Integrated Agriculture and Rural Development Policy

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Abstract

Sustainable agriculture development perspective has kept in mind on the project however; other social and economic improvements are obvious. Agricultural bio-security (food safety, soil fertility, and plant and animal health) and socio-economy (improved mass scale communal farming, strengthened networking/production/income, assured market chain, entrepreneurship, etc.) are major consideration. The project is applied for how increased quality agro products are produced without losing soil fertility and plant as well as livestock health. Similarly, project is supportive to improve income of local farmers by reducing invest cost and maximizing return of agriculture products is another project focus. Project's reliability, effective, and efficiency are guaranteed by secure market chain, entrepreneurship, networking extension. The project is experiential base including couple of socio-economic and agriculture theories. Farmers community, farmland, livestock, farm technologies, market, and agriculture service center are operational areas. Existing knowledge, practice, and perception of local farmers, agriculture experts, and development activists have been incorporated and will be kept accordingly. In coordination and guidance of experts, major sustainability parameters will be set. Main efforts of the project is to utilize the better opportunities and potentiality rather than solving the problem alone. Objectives: Increase secure market access for quality agro production with developed farmers capacity is main objective of the project. Followings are specific objectives; 1). Farmers capacities develop 2). Increase sustainable agriculture production (livestock and farm).

Keywords: Collaboratively institutionalized; Organized farmers; Farming system; Improved farm mechanism; Modern technologies; Advanced farm; Livestock productions; Commercialized products; Market assurance

Concept

Small Farmers Agriculture Cooperative started a Sustainable Integrated Agriculture Development Project (SIADP) in 2014 at Maharanijhoda Village Development Committee, which is a community-based and mechanized mass-scale commercial agriculture system. It is expected to be self-sustainable through improving and continuing quality agriculture production. In essence, the project comprises of inter-related operational aspects and their organized structures; collaboratively institutionalized/organized user groups amongst farmers, improved farm mechanism with modern technologies and inputs, advanced farm as well as livestock production, commercialized products and market mechanism as depicted in the following (Figure 1). Agriculture Service Center is assumed as the main co-coordinating body that coordinates all other activities. The project concept is based upon several researches, experiences, market demand and farmer's needs. Project replication in other potential areas is expected after successful implementation of the current project and an independent evaluation of the current project.

Consideration

Sustainable agriculture development and socio-economic wellbeing of farmers has been kept main project consideration. Agricultural bio-security (food safety, soil fertility, and plant and animal health) and socio-economy (improved and mass scale community- farming, strengthened networking/production/income, assured market chain, entrepreneurship, etc.) are the other substantial considerations.

The project attempts to learn how increased quality agro-products are produced without losing soil fertility; and plant as well as livestock health. Similarly, the project is supportive of improving income of local farmers by reducing investment cost and maximizing return of agriculture products. Project's reliability, effectiveness, and efficiency are guaranteed by community-based management; secure market

chain, entrepreneurship, networking, co-ordination and extension. It is empirical that it includes couple of socio-economic and agriculture theories as well. Farmer's community, farmland, livestock, farm technologies, market, and agriculture service center are operational areas. Existing knowledge, practice, and perception of local farmers,

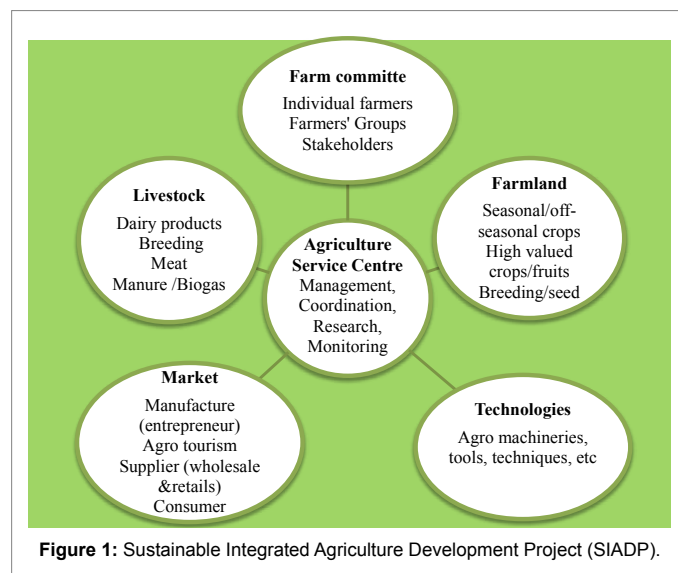


Figure 1: Sustainable Integrated Agriculture Development Project (SIADP).

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agriculture experts, and development activists have been incorporated. In coordination and with experts, major sustainability parameters have been set. Main efforts of the project is to utilize the better opportunities and potentiality rather than solving the day-to-day problem alone.

Objectives

The main objective of the project is to mobilize local resources for an employment generation and improved quality of life of small farmers.

The specific objectives are as follows:

1. To develop Farmer's capacity.
2. To increase sustainable agriculture production (livestock and farm).

Outputs

Increased commercialization of quality agro productions, increased agriculture productions through organized and mechanized practice are main outputs of the project. However, specific outputs are as follows:

Farmer's capacity develop

A) Established and continued institutionalized/organized private, public, and stakeholders base collaborative agriculture practice.

- More than 80% farmers from project area are covered under Farmers User Group.
- All concern/potential stakeholders; local, inter/national level directly or indirectly (collaborate or coordinate) involved.

B) Increased farmer's skills through trainings and extension activities; enhanced information and network.

- 100% project farmers receive required agriculture related trainings and information.
- Reporting, monitoring and management system kept in place.
- Established sustainable network.
- Established sustainable collaboration and coordination.
- Extended and strengthened collaboration and coordination.

C) Increased >100% income level of agriculture sector; technology base mass farming practice, diversified agro-productions etc.,

- 50% cost of production reduced by the use of farm machineries and technologies.
- Increased >60% income from diversified, intensified, and high valued agriculture production; farm and livestock products.
- Project farmers received >20% increased return from chemical free agriculture production.
- Increased >50% income from added value on the productions; commercialization.
- Increased 20% employment from agro-tourism promotion.

D) Assured market approach.

- Endorsed 100% market of the productions.

Increase sustainable agriculture production (livestock and farm)

a. Improved and induced agriculture practice by 100%; land structure, quality, livestock system.

- Communal farming executed at >80% farmland of project area.
- Community base commercial livestock managed and operated >80% of project area.
- Commercial livestock managed and operated >80% of project area.
- Intensified and diversified practice.

b. Increased quality agro-productions; livestock and farm products.

- Improved 100% land structure and soil quality.
- Produced chemical free productions.

Activities

To achieve objectives and expected outcomes/outputs series of activities are planned. These activities are directly or indirectly associated with sustainability of the project. The activity schedule is as follows (Table 1).

Activities summary

Formed farmers user group committee: One Farmers user committee is formed by farmers, which includes 100-hectare farmland. The committee is responsible for whole project implementation, monitoring, planning, coordination, and collaboration with stakeholders.

Land acquisition, managing, and farming practice: About 66 hectares existing farmland of farmers is encompassed on one model project area. All project land kept on cooperative model (equity share distribution) then started community farming. It assures the proportional investment and return of shareholders. Existing traditional farming system is modernized with commercial mass farming system. The project land will be restructured and all required infrastructures and facilities provide. To contribute to the demand of uneven urbanization growth of Nepal; more production, cultivation of high value crops, and crop intensified and diversified will be promoted. Certain land area will be allocated for seed production and seed bank.

Dairy farm: Based on annual requirement of manure in total project farmland, number of livestock (she-buffalos/cows) farm established. Cattle manure is used as compost fertilizer at farmland then produce chemical free agro-products and maintain soil fertility and quality by five years of the project implementation. Community-based Biogas plant is constructed in support of Biogas Support Program (BSP) of Nepal. Slurry will be used on farmland and biogas will be distributed for household fuel. Demand base dairy and meat products will be supplied at local and national markets. A variety of products like meat, milk, yogurt, cheese, butter, ice cream, sweets, etc. will be manufactured through entrepreneurs.

Post-harvest Centre established: The established Centre enhanced independency on own seeds and productions.

Entrepreneurship Promotion (agro productions and dairy based): Local agriculture and livestock (dairy and meat) base entrepreneurship will be promoted. Enterprising, production of fresh

S.N.	Activities	1	2	3	4	5	Remarks
1.a. Established and continued institutionalized/organized private, public, and stakeholders base collaborative agriculture practice							
1	Orientation/Discussion meeting with project farmers	■					
2	Farmers User Group/committee formation	■					
3	Stakeholder forum meetings	■	■	■			
1.b. Increased farmers' skills through trainings and extension activities; enhanced information and network							
1	Network/Coordination expansion and strengthen	■	■	■	■	■	
	Training to lead farmers on improved crops cultivation practices-5, Farm management-5, crops management-5, Postharvest management-5, organic manure-5, livestock management-5, Dairy farm management-5, Organization development-5, capacity development-5, marketing-5, Compost fertilizer making-5	■	■	■			
2	Workshops (Integrated Agriculture practice related)	■	■	■			
3	Seminars			■		■	
4	Construct Farmers' field school for demonstration of improved integrated agriculture practices (Lesson learn Centre)		■				
5	Exposure visit for farmers and cooperative officials to best agriculture practiced areas, Nepal and India	■	■				
1.c. Increased >100% income level of agriculture sector; technology based mass farming practice, diversified agro-productions etc.							
	Appropriate tools and equipments implementation in farming	■	■				
	Tractor-2	■	■				
	Laser leveler machine-1	■	■				
	Combine harvester-1	■	■				
	Rice Transplanter with seedling machine and Trays (3000)-2 sets	■	■				
	Hay Bailer-1	■	■				
	Zero-tillage Machine -1	■	■				
	Deep Boaring-2	■	■				
	Sprinkle pipe set	■	■				
	Electric Transformer-1, with wire and poles	■	■				
	Support in breeder seeds (Rice and Wheat)	■	■				
	Compost fertilizer preparation machine	■	■				
	Establish and operate postharvest lost management centre	■	■	■	■	■	
	Agro-tourism centre promotion			■	■	■	
	Establish financial and market cooperative	■					
1.d. Assured market approach							
1	Promote of collective marketing by farmer groups and cooperatives	■	■				
2	Establish an effective market information system	■	■	■	■		
3	Market exposure and exploration farmers visit for trade	■	■	■			
2.a. Improved and induced agriculture practice by 100%; land structure, quality, livestock system							
1	Establishing community based farming systems	■	■				
2	Restructuring farmland (Land labeling, Sector based land management)	■	■				
3	Establishing community based Soil Testing Service Centre		■				
4	Supporting to improved cows		■	■			
5	Construct model cow farm		■	■			
6	Support in improved female calving semen (sex semen) supply to AI		■	■			
7	Promote improved fodder and forage center		■	■			
8	Promote feed & fodder processing equipments		■	■			
9	Exposure visit to model dairy farms		■	■			
10	Support to Cow insurance		■	■			
11	Community base biogas plant and compost fertilizer technologies establish		■	■			
12	Strengthen and expand coverage of milk collection and chilling centers (support in dairy equipments)		■	■			
	Baseline Survey-1 times	■					
	Mid-term Evaluation -1 times			■			
	Final Evaluation -1 times					■	
	Monitoring / Supervision	■	■	■	■	■	
	Progress and Financial Reports-10 reports	■	■	■	■	■	

Table 1: Activities.

agricultural products is not only the agenda of income and employment generation rather extend value addition to achieve maximum benefit.

Approaching market and Marketing: Cooperative base agro-products stalls (dealers and retail shops) will be operated at local and national markets. Direct approach with consumers is main strategy to ensure products' market. Participating in local to international trade-fare and through other media, products will be promoted.

Established Agro-tourism centre: At farmland, small cottages restaurant constructed and eco-tourism (home stay) promoted that can be lucrative for domestic and international tourists. Local fresh chemical free farm foods and farmland visit are main attraction.

Cooperative development: To manage and ensure financial stability as well prosperity of farmers, financial and market cooperative will be established that operates saving, credit, and insurance program. It takes responsible for financial and market management.

Trainings: To boost capacity of local farmers, all required trainings related to farming, dairy, veterinary, entrepreneurship, agromachineries, cooperatives, marketing, etc will be provided to project farmers and ensured the sustainability of the project.

Coordination and collaboration: Required coordination and collaboration make with stakeholders. Inter/national organizations/institutions, line agencies, Farm machineries suppliers/dealers, agriculture universities, research centers. Established centre provides global information and network to local farmers. Make coordination and collaboration with e-library and e-marketing centre. Executive committee takes responsibility to expanse its network at local to inter/national level. After assuming the success of the project, this concept will be replicate to nearby villages.

Monitoring and evaluation: Selected team members will take responsibilities for regular monitoring and evaluation. For the purpose, means/source of verification and measurable indicators will be set to address objectives at the outset of the project.

Operational Strategies

The project will follow a co-operative model i.e., equity share distribution. As such, 49 small farmers have agreed to pool about 100 Bighas (66 hectares) of land for the community farming; specially rice plantation. They plan to share any benefit from the farm amongst all of them. The Small Farmers Agriculture Co-operative promotes this initiative.

In order to increase land productivity and limit post harvest loss to a minimum level, several inputs will be put in place. Some of the planned inputs will be soil treatment, mechanization for rice plantation, weeding and harvesting; improved irrigation system and secure storage of grains.

- Some small-scale agro-based processing plants will be installed. Marketing of agro products will be targeted to local markets.
- A few financial institutions will be attracted to finance operational activities of the project. Some equity shares will be allocated to these institutions. External funding opportunities will also be explored.
- The entire management of the farm will be responsibility of the Agriculture Service Centre. A committee nominated by the members will be assigned for management of the farm.

- Sustainability of the project will be ensured through development of reserve funds.
- Learning from the project will be disseminated in partnership with local farmers and national institutions such as NARC.
- Community mobilization and sensitization for the further understanding of the project will be adopted.
- Beneficiaries will be participating in project planning, implementation, monitoring and evaluation phases.
- The active collaboration of extension services of Government of Nepal and NGO/CBO during project implementation will be under taken to wider dissemination and uptake of the project outputs.
- Farmer's exchange visit will adhere to scale-up knowledge dissemination on improved agriculture technologies and practice.
- Training of Farming Project executive on the planning, implementation, monitoring and management.
- Purchase and distribute viable seeds, ensure that certified seeds approved by the seed board are bought.
- Purchase and distribution of livestock (cows).
- Purchase and distribution of Agro machineries
- Agribusiness market development.
- Construct Suitable technology for post harvesting and processing.
- Supervision, monitoring, reporting and evaluation of project activities.

Initiated Activities

For the proposed project, following activities have been accomplished as of now:

Farm machineries adaption

According to project objectives, Rice seedling, and rice transplanter machines, zero tillage machines have been introduced, adjusted, and adapted at project area. These machines are cost effective and efficient for reduced workload; recovering labor crises, and becoming good source of income. Similarly, zero-tillage machine, supported by Nepal Agriculture Research Centre (NARC), was applied for wheat cultivation.

Organized farmland and initiated communal farm

Total 66-hectare farmers' land has been organized and initiated community farming at project area and other 40-hectare in process. Wheat, winter/summer rice, vegetables have been cultivated since last year. Priority has been given to seed production. Twenty years agreement has been made with farmers. Farmers have given positive response to stakeholders.

Problems statement and justification

Low productivity with low quality, unorganized farming system, lack of access on modern and improvised technologies (farm machineries, seeds, fertilizer, experts, knowledge), and low access/approach on market and price are major problems on agriculture sector of Nepal. Mr. Banki Mun , UN Secretary General, addressed a UN-

sponsored summit in Rome stressing that food production would have to rise by 50% by 2030 to meet demand. The recent crisis is believed to have pushed 100 million people into hunger worldwide. Poorer countries are faced with a 40% increase in their food imports bill this year [1]. According to World Food Programme (2009) [2], the number of undernourished people in the world increased in 2008 to 963 million, a leap of 115 million over the past two years. Nepalese topographic variation constitutes variety of Agro Products, Fruits, Livestock, etc. with huge potential for development despite high productivity of Land. In many districts, agro-products supply from elsewhere. Nepal Rastra Bank (2011) [3] report mentioned increasing trend of labor export in foreign countries has pushed the cost of agricultural production..., the wage of agricultural labor increased by 43.7 percent. Central Bureau of Statistic mentioned one third of the population (31.8%) lives below poverty line [4], (Figure 2).

Marginal farming: excessive use of chemical fertilize without proper knowledge, and practicing traditional way of farming causing marginal productivity. Haphazard uses of chemical fertilizer and seeds have had consequence on soil and food quality. Farmers are not well trained on modern farming system and following traditional way of seeding, planting, harvesting, and storing. Exploration of induced traditional Knowledge base farming system with modern technologies (machineries and knowledge) and enhancing local level

entrepreneurship expected in reduction of this scarcity by increasing productivity and production.

High cost of investment: High operational or investment cost has realized at project area because of labor-intensive farming. Individual household base agriculture system is major challenging factor for development. Individual household is responsible for loss or profit of investment and per unit cost of production becomes higher. Foreign employment and high paid job in urban area are lucrative for energetic youth. Working efficiency of farm labor has reduced as compare to before.

Land fragmentation: In Nepal, about 40 years ago government stopped farmland expansion policy. On the other hand, single-family structure has been overriding the joint-family system; consequently loosing the active labor force for farming and property rights on father's property causing land fragmentation that ultimately increasing cost of production.

Declining Livestock practice and compost fertilizer use: About 10 years before, we used compost fertilizer of manure in farmland. Because of single-family structure now no more time for livestock ultimately affecting on soil fertility, shortage of milk, and meat.

Psychological domination: In Nepal, generally, agriculture occupation is regarded low status occupation so most of the educated and well status people do not want to involve on this profession.

Increased price: According to WFP (2009) [2], price of some food stuffs raised by as much as 40 percent, in 2008, were because of Bandhs and blockades, high transportation costs and transport syndicates that has direct impact on rural people mainly. Thus, local agro-food products are realized to be explored at local level as well. Market monopoly of particular set of food product are causing gradual decline in variety of food items produced, causing erosion of conventionally produced variety of food items. In this context, there is dire need for food security by promotion of local community attracting youth through employment generation by commercializing agro-production.

Health concerns: Food and livestock produced with extensive use of agrochemical, and adulteration has rooted negative impacts on human health causing different types of health ailments. Integrated community base farming system enhances the local community base organic products.

Low risk bearing capacity: Farmers hardly adopt and invest the new farm technologies because of low risk bearing capacity. Last year we bought one new combine harvester from China, most of the farmers did not relay on harvester and harvested their rice manually, though the rice harvesting by harvester was lower cost than labor. Now, harvester is being demanded after successfully operated.

Deprivation on access and approach: Individual farmer has low access and approach to stakeholders, government, information etc., as compare to farmer group. They are deprived from either government or other organizations support whereas farmers groups and cooperatives have been receiving support from concern institutions.

Insurance policy: In Nepal insurance companies are not focusing on agriculture sector that's why during disaster and natural calamities farmers losses individually. Organized community base farming system will be able to promote crop, animal and other agro-products insurance system.

Lack of expertise's involvement: Educated persons (farmers' son/ daughter) mostly do not return village and support our ancestor's



Figure 2: Problems Statement and Justification.

occupation, after graduation. On the other hand, most of them study different study programs not associated with agriculture so they run away for future security in their respective areas.

Exploitation of business: Local brokers creates artificial crisis in market during off-season though the products are high demand and sufficient supply. During season, they buy in low price and sale in unevenly high price consequently farmers loss the benefits. Farmers do not have direct access on market however; their products demand is higher.

Crisis of seeds and fertilizer: Currently, farmers have been suffering from low quality of seeds and fertilizer as well as untimely unavailability. Many farmers' cooperative have been managing and

providing these services in coordination with concern organizations and institutions but they are not enough, yet.

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