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**CONCEPTS AND METHODS OF SAERP/DARDIS AS
A SUSTAINABLE RURAL DEVELOPMENT
STRATEGY IN AFRICA**

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1. Background

1. Africa being the second driest continent next to Australia, moisture stress is the major limiting factor for crop and livestock production particularly in the arid and semi-arid areas. Over 65% of the rural and 25% of the urban population in Africa are without adequate water. At present some 14 countries are facing serious water scarcity and by the year 2,025 about 26 African countries are expected to face serious problem of water scarcity.

2. The dryland ecologies of Africa facing the problem of insufficient and erratic rainfall distribution are also characterized by highly fragile natural resource base. Soil erosion rates are very high in the semi-arid areas. UNEP has estimated that some 6.9 million square kilometer (23%) of all land prone to degradation in the world is found in sub-Saharan Africa.

3. Today the livelihoods of millions of smallholders in Africa depend upon the crop, livestock and the surrounding natural resources. Due to the low attention given in the past serious and irreversible environmental problems are occurring such as serious decline in the productivity of agricultural lands. In addition to the short growing period of crops due to low rainfall, the fertility and waterholding capacity of the soils has declined because of the increasing human population which is associated with inappropriate land husbandry practices. This means that an increasing number of rural poor are moving into more fragile ecologies. As a result of land use intensification due to the increasing human population, which is associated with inappropriate land husbandry practices, fallow period declines and crop production expands to grazing areas, as well as marginal and ecologically fragile lands. Such unbalanced practices which lack appropriate resource management technologies inevitably lead to marginalization of livestock production and degradation of the natural resource base.

4. As a result of these interrelated factors, many countries in Africa today face exceptional food shortages and millions of people are found in absolute poverty facing the threat of famine and starvation. The percapita food production in Africa has steadily declined over the last 25 years and where each day three out of five people in 17 countries cannot get enough food to meet their daily minimum requirements (FAO, 1996). Even in the absence of famine and starvation, malnutrition is a widespread problem and an increasing number of people are becoming more vulnerable to climatic fluctuations. The Sub-Saharan African countries have been particularly affected by the debilitating and widespread effects of hunger and poverty and the challenge is most daunting in this region of Africa. More than 200 million people are found to be food insecure in SSA and this is expected to rise to over 250 million by the year 2000, if present trends continue.

5. In this context, real and lasting food security in Africa has to depend on a sustainable and productive resource base and yet that base is being undermined by widespread and accelerating land degradation and increasing population. Therefore, the current trends in Africa are leading to an intractable situation of rapidly rising populations, declining productivity of land and declining per capita food production. This is a serious concern to policy makers and development experts in that unless the cycle is reversed, the natural resource base will continue to be degraded and the number of people suffering from poverty, hunger and malnutrition will continue to grow. Therefore the central question of policy makers in Africa is how to reverse this rapidly deteriorating situation of food insecurity in Africa.

6. Up to now very little attention has been given for sustainable development, food security and environmental protection particularly in the arid and semi-arid areas of Africa. Such fragile areas have received less policy attention or support and certainly less investment for development.

7. Most African governments and donor agencies are now aware of the problem and are paying increasing attention to the widespread effects of hunger and poverty. There is

also a growing understanding of the critical links between Africa's great problems of food insecurity and the environment.

8. The failure of past efforts can be traced to the fact that policy formulation was pursued too narrowly along the conventional sectoral lines and also because they failed to address the crucial cross-sectoral linkages and synergies. Furthermore, past development efforts were depending on external resources which were provided together with generalized strategies and approaches which were non-specific to the problem areas. Development programmes were not addressing the interlinked problems of the communities or the concerned areas due to lack of commitment to begin with and also due to the absence of know-how, including concepts and methods. The easiest course adopted by many African countries was to depend on external agencies for the mobilization of human and material resources even when it was recognized that these resources could not stop or reverse the deteriorating situation of general food insecurity and growing poverty on a mass scale. This heavy dependence on external agencies led to the adoption of policies, strategies and programmes which only worsened the situation. It is obvious that without a nationally motivated and developed programme, foreign technical assistance could do very little in tackling the problem. In general the most common features and constraints of past development programmes were imported design process, complete disregard of participation of beneficiaries, concentration on purely production targets, neglecting other important complementary factors for development such as infrastructure, credit and marketing, family planning, gender issues and others.

2. The SAERP/DARDIS Programme - Concepts and Objectives

9. African countries have so far experimented with a variety of rural development programmes. Majority of these programmes were exotic and African farmers and rural development workers were forced to follow the strategies developed by outsiders. Because of such inappropriate policies, poor institutional setups, improper project design

and implementation and lack of participation by beneficiaries, most countries of Africa have encountered very slow rates of growth and development. It has become timely and crucial to raise serious questions on issues contributing to food insecurity in the continent. Of most immediate concern are the critical questions that need to be raised and answers provided to rehabilitation and development of arid and semi-arid areas of Africa where over 50 percent of Africa's rural population live under difficult conditions. These areas require urgent policy actions. This paper offers some evidence, based on the recent experiences in some African countries, that indeed these areas can be rehabilitated and developed, given the will and political commitment.

10. In recent times, the United Nations System, more particularly UNECA and UNDP, initiated a serious programme of development for the arid and semi-arid areas of Ethiopia and Eritrea. This programme was initially initiated in Ethiopia through the collaborative serious efforts of the Government of Ethiopia and it is in this country where very concrete results have been achieved and whose lessons need to be captured by African countries facing serious problems of aridity in their rural agricultural areas. In order to address the problems of dryland areas in Africa, a special programme called SAERP (Sustainable Agriculture and Environmental Rehabilitation Programme) was first conceived. The designs of the SAERP Programme containing multi-disciplinary programme components of population environmental and agricultural production, using water resources as the dynamizing resource for the rehabilitation and development effort of the arid and semi-arid areas. Consultations are now underway with African countries facing the problems of aridity with a view to incorporating the design frameworks in their country programmes.

11. The United Nations system, in line with the initiatives that it has taken in evolving unique design components for SAERP, also initiated a separate (but complementary to SAERP) programme design for areas not affected by aridity but whose extension system needs to be revitalized and restructured along the lines of people centered development. The programme which has evolved is called, DARDIS (District Agriculture and Rural

Development Integrated Services). The components of DARDIS include all technical disciplines that concern the nexus issues of population, environment and development. DARDIS, as will be explained subsequently, is designed to operate, taking into consideration the application of two basic principles in the transfer of extension technology at the grassroots level. These two basic principles involve the serious application of **para-professionals** and **matching** funds. Therefore both SAERP and DARDIS are not only complementary to each other, but they also share the same development objectives

12. The SAERP/DARDIS Programme has four interrelated objectives of increasing production, participation, capacity building and environmental rehabilitation.

13. **Participation:** The central issue of development for the rural poor in Africa today is how they can become effective actors in designing and shaping their own future. For too long African farmers have been accustomed to hand-out and this strategy has not worked. Beneficiaries should be directly involved in all developmental issues concerning themselves and their future. It is only if they are committed to bringing change that change can come about. If participation is not forthcoming in the required scale, it is because the local space for operationalizing participation and the specific policy/strategy, technical and institutional conditions are not adequately defined and strengthened.

14. **Increasing production:** Breaking the cycle of agrarian stagnation in Africa is the second major objective of the SAERP/DARDIS programme. Recently some commendable efforts have been made to break the cycle of agrarian stagnation in many countries of Africa. However, the rural communities in many of these countries are still in a situation where even subsistence survival is not assured. Resources for the recovery of Africa's agrarian stagnation are limited and these have to be principally generated from the rural communities themselves. In most of the fragile ecologies, arable lands are limited and average holdings have reached critical levels where they cannot indefinitely diminish.

15. **Environmental Rehabilitation:** The seriousness of environmental deterioration in African communities is manifested in several forms as: massive deforestation and land degradation, contributing to soil moisture deficiency; energy loss in both rural and urban areas, further aggravating the cycle of degradation and deforestation; the drying up of river beds and declining water tables affecting the climatic configuration, thus contributing to recurring droughts and the resultant famines. Therefore the need for special attention on the rehabilitation of environment is one of the primary objectives of the programme. Environmental rehabilitation can only be addressed objectively and efficiently at the grassroots level where people work and live. It is also important to remember that environmental recovery will have to operate on the basis of evolving effective prioritized and logical programmes of development.

16. **Capacity Building:** This is the fourth objective of SAERP/DARDIS Programme and addresses the issue of building capacity at the level of both "modern" institutions and also at the level of beneficiaries that these institutions serve. The issue of bringing about enhanced capacity in a situation of deepening financial crisis of the state requires careful and systematic resource identification and planning. This problem again can also be addressed effectively only if we have sufficient knowledge of the recourse potentials of local communities.

17. The SAERP/DARDIS Programme also seriously address the issues of common concern to the four objectives described above. One of these is the plight of women in rural Africa who help produce most of the wealth, and yet remain disempowered by markets, politics and patriarchy. In this paper we shall discuss, separately, the concepts and methods of SAERP and DARDIS.

18. The SAERP programme is conceived as a replicable instrument but with due consideration to each specific country of application. The basic tenet of the programme is sustainable agricultural production in arid and semi-arid portions of Africa as a means to

break the cycle of agrarian crisis. At the same times, through DARDIS, effective and sustainable changes could come about if African countries restructure and redirect their extension systems to ensure that beneficiaries play effective roles in and share the burden of the extension system.

19. In SAERP the focus for sustaining crop production, particularly under adverse natural conditions calls for examining the main resource bases which are land, water and agroclimatology.

20. At a micro level, the input to the SAERP system will involve catchment rehabilitation, meticulously studied and designed water harvesting mechanisms and small-scale irrigation systems. The programme is also considered as a corrective measure to break the cycle of the on-going environmental degradation by making use of conventional wisdom and indigenous know-how and practice. This programme demands, to a large extent, the mobilization and organization of all local resources, for instance land, water, human resources etc., towards an efficient and effective resource utilization.

21. Sustainable mode of crop production also requires the integration of major activities that would give impact on one another while at the same time these activities might have remained constraints if not addressed and linked properly. Thus the small-scale watershed-based irrigation intervention as a means to mitigate drought will need to develop initially, the water resource potential at the appropriate scale. The scale of water resource development under SAERP is small and focuses on water harvesting to meet the demands of crop production. Basically, the water to be harvested is the excess run-off generated as a result of the rainfall occurring over a catchment, which is rationally estimated to be just enough for crop production and will be used to irrigate the proposed irrigable land at least for one reliable harvest or twice in a year if used as supplement. No part of any country in Africa is too dry that small-scale irrigation cannot be organized. Morocco is a good example: a country with enormous aridity has succeeded in having one

million hectares of land under irrigation, 50 percent of which is under small-scale irrigation.

22. The small scale feature of the irrigation development within the SAERP framework is attained not only because of the size of irrigable land and the microdam used to harvest runoff, but is also due to the low cost and appropriate technology considerations for planning, study, design and construction, and more importantly due to the provision of the operation and management of the developed irrigation farms to be totally handled by the beneficiaries themselves.

23. As stated above water harvesting within the SAERP context encompasses the harvest of rain water from drainage basins for collection and storage of water for its beneficial use. In contrast to the holistic context which includes farm practices, standard engineering, watershed management and crop production sciences and technologies are also applied.

24. The water harvesting techniques of SAERP are intended to be applied for:

- arid and semi-arid areas where runoff is of an intermittent character; local water such as surface runoff, creek flow, stream flows springs are targets of the water resource development activity. This doesn't include storing river water in large reservoirs or mining of natural ground water aquifers; limited scale operations in terms of catchment area, volume of storage and capital investments.

25. The main supporting services and essential components of SAERP are the following:

- Design and construction,
- Watershed Management,

- Environmental Hazard Assessment (sedimentation, salinity, water-borne diseases etc.),
- Irrigation Infrastructure,
- Irrigation Agronomy,
- Population Issues - Labour Use and Human Resources Dev.,
- Technology Choice and Maintenance,
- Infrastructure Development,
- Livestock Development,
- Water Users' Association,
- Management of Water Resources.

26. These components, right from the beginning of site selection, are investigated and planned in an integrated manner. The entire planning process involves beneficiaries, because it is them who will, through their labour inputs, build the dams and maintain them.

27. The major components of runoff harvesting and irrigation development of SAERP are the drainage basin over which the runoff is generated, the water harvesting mechanisms (microdams, ponds, diversion structures, etc.) and the irrigation infrastructure. Therefore, the concept of "scheme" which consists of the watershed management, water harvesting mechanisms and irrigation system, inter alia, has become one of the important planning frameworks for the SAERP programme.

28. In order to ascertain cost effectiveness, the small scale irrigation projects in SAERP should consistently follow the planning, design and implementation cycle. A valuable lesson to be learnt from previous similar projects is that there had not been the provision and procedure to check the soundness of projects at various levels of study prior to committing resources. Therefore all SAERP projects are planned in a defined scheme and each component of the scheme are given due emphasis in the course of planning, study, design and implementation so as to ensure sustainability.

29. At each phase of the project cycle, investigation of each project is carried out so that a decision can be made to proceed to the next phase or discontinue the next proposed study activity because of obvious lack of viability in terms of technical, economical/financial, environmental and social parameters.

30. As part of the planning, study, design and implementation process, the project cycle to be followed in SAERP necessitates the sequence of events commencing with the generation of an initial project idea, passing through successively more detailed stages of study and design to implementation while conducting monitoring and evaluation at the end of each phase of the project cycle.

31. The underlying rationale for project cycle in SAERP is the need for successive screening and decision-making to ensure that resources are only committed to acceptable projects. Thus the financial, human, institutional, natural and other resources are expended at all stages of the cycle before, during and after implementation. The six stages of project cycle in SAERP on which monitoring and evaluation (review) has to be made are project Formulation and Identification, Reconnaissance, Feasibility, Detail Design, Construction Implementation, Handing over and ultimately maintenance by beneficiaries.

32. The broad frame of viability within the SAERP programme are:

- Location of the scheme preferably in a drought prone/semi-arid zone.
- Non-involvement of water basin problem.
- Non-creation of any adverse effects both on the upstream water users and the downstream water users.
- Protection of established water rights and uses i.e. interest of downstream users for agriculture, water supply, livestock, pollution control etc.

- Non submergence of important forest species, produce or areas of monuments of national importance, mines or mineral deposits.
- Non adverse effects on the existing environment, rather promote the possible contribution of the scheme to the improvement and conservation of the environment.

33. The implementation of SAERP Programme started in Ethiopia with the initial design process initiated for SAERT (Sustainable Agriculture and Environmental Rehabilitation Programme of Tigray) in 1993. The SAERP design process culminated in the formulation of a complete package of technical and institutional components for the expansion of small scale irrigation using water harvesting methods of dams and river diversions. The success achieved in SAERT has contributed to its expansion. This design process has now spread throughout Ethiopia and as envisaged, regional commissions have been established in various regional states of Ethiopia.

34. If the basic principles of SAERP are met in other parts of Africa, the programme could serve as a gateway to a new agrarian system which rests on sustainable agriculture in general and crop husbandry in particular. The radical improvement of crop husbandry has direct impacts on revitalizing the other allied sub-sectors of agriculture and rural development.

35. The District Agriculture and Rural Development Integrated Services (DARDIS) was initiated due to the wide spectrum problem of rural development and food security, as well as limited coverage of SAERP. The conception of DARDIS is also an entry point for reformulating agrarian policies and re-designing rural development strategies and programmes, because it is only at the district/location level that secured and reliable insight can be gained for the resolution of the many and persistent agrarian problems.

36. The DARDIS concept is a logical step for managing critically limited resources at the lowest administrative/production level - the district (location), using the beneficiaries

themselves as planners and administrators of the resources. Within a district/location/ it is possible to find a number of different agro-ecologies or traditional farming systems to be considered during planning. DARDIS operates on the agro-ecological basis of planning which seriously considers temperature, altitude, rainfall, soils and farming systems.

37. As a planning and implementation concept, DARDIS could also introduce reliable self-perpetuating and self-sustaining mechanisms for effective changes at the local level. This is primarily because all elements of planning, monitoring and evaluation and implementation will be undertaken with the beneficiaries as leaders of these processes. Thus it is only through grassroots people-centered programmes that sustainability of changes can be assured in the long-run.

38. DARDIS as a multi-disciplinary grassroots programme has several technical components which support growth, equity, institutional effectiveness and sustainability. This include the active and effective organization of extension and production, social and physical infrastructures, and human and natural resources development all of which have individual sub-components. The DARDIS programme consists of several multi-disciplinary team studies categorized into Agricultural Development, Environmental Rehabilitation and Economic and Social Development. The essential components of DARDIS study teams are thus:

- Agronomy
- Crop Protection
- Livestock Production
- Apiculture
- Livestock Feed Development
- Fisheries
- Soil Conservation
- Forestry and Wildlife Development & Conservation
- Infrastructure Development

- Agricultural Extension
- Health Services
- Education
- Women's Development
- Institution Building / Human Resources Development
- Micro Programmes / Employment and Income
- Population Studies

39. The intent of DARDIS is to assist in operationalizing the concepts of farmer managed schemes to the extent that the institutional and social conditions permit for such to happen, invoking the two basic principles of grassroots participatory extension - the use of matching funds and para-professionals of the beneficiaries themselves.

40. In addition to achieving the four major objectives of increasing production, environmental rehabilitation, capacity building and participation, DARDIS seriously considers other important indicators such as cost effectiveness. This will help DARDIS to be sustainable and will enable it to continue as a sustainable programme. Other important considerations of this programme include decentralization and democratization; attaining of behavioral and attitudinal changes at community level; encouraging the creations of institutions of beneficiaries; building capacity for organizing and managing credit and marketing services by beneficiaries; facilitating the creation of a strong information base at the level of beneficiaries; optimal use of local resources, specially labour resources; assist in creating strong linkages between people , government to people and institutions, and ensuring measurability of progress.

41. DARDIS can not start in all areas simultaneously . The application of DARDIS on a wider scale will be dictated by one's capacity for serious economic planning and programming followed by institution building. The DARDIS programme proposed to be implemented at the district level has seven major components of rural development services. This are : agricultural production services ; environmental rehabilitation and

development; technological change - extension and research ; infrastructure and economic services ; social services including conscientization ; institutional capacity building and investment promotion services.

3. SAERP/DARDIS Within the Context of ECA's New Development Strategy

42. The major constraints of food security and sustainable development in Africa are factors that are highly interlinked. Despite the efforts made by African governments in power as we see today, there is lack of well conceived practical and workable measures on how to achieve the development objectives of most African countries. Furthermore, majority of the rural development programmes designed for African countries were ineffective contributing to the failure of achieving the targeted objectives. Some of the most common and repeated undertakings were: lack of community participation in the process of problem identification, programme formulation and implementation; lack of integrated programme approach for tackling highly interrelated problems, heavy reliance towards conventional sectorline approach and high inclination and bias towards increasing of production rather than integrating such programmes with other sectors such as environmental protection and population control.

43. There is a strong synergy linking the declining agricultural productivity, rapid population growth and environmental degradation in many parts of Africa. Due to this highly interlinking vicious cycle the traditional farmers, particularly the poor are trapped and slide into serious poverty. Now, there is a growing understanding, by most African governments and donors, of the critical linkages among the major constraints of food insecurity, environmental degradation and population growth. Due to the increasing stress among the population in the fragile ecologies, some African governments have developed a number of rural development programmes to adapt conservation based development, to achieve food security and overcome poverty. So far most of the investment has not been effective due to the complex environmental, economic and other constraints. However, there are some African countries with success stories of rural development and food

security. Ignorance on the existence of successful and sustainable natural resources management and their effective dissemination, among others, hindered the development of Agriculture in the dry lands of Africa.

44. The United Nations Economic Commission for Africa (UNECA) has created a better structure and commitment to assist the countries of Africa. UNECA through its new Division of Food Security and Sustainable Development (FSSDD) has developed a holistic approach to food security, taking the integrated inputs of environment, population and agricultural development into consideration. In the past the above three components of the nexus were managed separately under three different departments within ECA. The three transitions (nexus) are now considered as the logical derivation on how to alleviate and eventually eradicate poverty from developing countries, world wide.

45. The FSSD Division has launched an interdisciplinary effort for reversing the current situation of declining food production, high rate of population growth and natural resource degradation. The main aims of the new programme of ECA are:

- raising the awareness of policy makers of the urgency to integrate food, population and environmental issues in planning;
- capacity building to manage nexus issues and sustainable development at national levels, and
- strengthening cooperation among member states for sustainable and equitable utilization of resources, application of science and technology to food security and sustainable development.

46. These can be achieved by the preparation of policy analysis and studies on food security, environment and population dynamics; dissemination of best practices to stimulate local actions, and the promotion of advocacy and awareness-raising and

networking for the effective management of the nexus issues. FSSDD is now involved in a continuous assessment of best practices on a country by country basis.

47. The SAERP/DARDIS Programme of FSSDD is an example of integrated rural development programme which also used the country level approaches for addressing the problem of nexus issues. The programme promotes agricultural development and participatory environmental rehabilitation where local communities participate more effectively in the development processes that affect their future. Both SAERP and DARDIS programmes properly address the highly interlinked issues of the nexus which is now considered as the leading concept to be used by African countries for alleviating problems and promote development. During the past months UNECA's FSSDD has been preoccupied on how best to take the vast knowledge and experiences gained in the SAERP/DARDIS field level exercises. As a result of the efforts made during this time, it has been realized that several African countries have keen interest in adapting the development works being done in other arid and semi-arid agro-ecologies including those that exist outside Africa such as Israel.

48. Through the use of innovative advocacy and in collaboration with other regional bodies, FSSDD is seeking to bring to the attention of African policy makers the successful experiences in Africa concerned with the complex issues related to rapid population growth, environmental degradation and food security.

49. The FSSD Division has been actively pursuing the possibility of creating strong partnership between UNECA and IGAD. Such a partnership is being developed with other sub-regional bodies as well. The creation of partnership was particularly pursued with regard to the need for replicating, within the African sub-regions, the experiences and technical knowledge obtained by UNECA during the implementation of SAERP/DARDIS programme. Since the SAERP programme is exclusively oriented towards addressing the specific problems of dryland ecologies, many countries in Africa have expressed high interest in this programme. Some African countries have visited the

offices of the Secretariat of the SAERP/DARDIS Programme. The SAERP/DARDIS Programme of UNECA will be “replicated” in other African countries in close cooperation with sub-regional bodies as has been undertaken with IGAD.

50. As a result of partnership developed and special interest of IGAD in UNECA’s SAERP programme, FSSDD has made serious efforts for promoting close relations among IGAD countries in the specific context of addressing issues of dryland agriculture and environmental rehabilitation. The main strategy of FSSDD for promoting and disseminating the basic concepts and best practices of SAERP is to first promote it in the IGAD sub-region and further develop this promotion work in the other sub-regions of Africa.

51. In order to promote the above stated strategy, FSSDD presented a package of programmes for joint execution by IGAD and ECA. Full understanding was reached on the programmes including the need for a phase by phase implementation of the programmes.

52. As a result of the agreement reached between IGAD and FSSDD, priority was given to the two project proposals prepared by SAERP on food and feed security. The conception of FSSDD on Food and Feed Security takes into account the inseparable dimension of these two issues. Therefore, the strategy of FSSDD on the replication of SAERP throughout Africa is starting to bear fruit in that a joint IGAD/ECA Sub-Regional Workshop on Food and Feed Security will be held in Addis Ababa, Feb. 1-4, 1999. Representatives from all the IGAD member states and resource persons (scientists) from several international organizations on dryland farming will participate on the workshop. The workshop, the first of its kind, is expected to review sub-regional and international experiences on dryland farming and is expected to open the door for the implementation of the next phases of FSSDD’s development strategies for the other sub-regions of Africa. All countries in Africa facing the problems of aridity will be invited to attend the forthcoming UNECA/IGAD workshop.

