



Developing Agricultural Machinery

Industrial Sector (AMIS) in Africa
– UNIDO's Approach

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> Presented by Dr. Namal Samarakoon Industrial Development Officer Agribusiness Development Branch UNIDO, Vienna



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Structure of the presentation:

- ✓ The need for a strategic approach to develop the AMIS
- ✓ Objectives of the study and the challenges faced
- Methodology adopted
- ✓ Development strategies



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A basic sector at the interface between agriculture and industry:

Efficient local production and use of the right kind of agrimachinery are fundamental to Africa's development:

- Raise productivity of agriculture
- Increase production of food crops
- Provide better storage, transport and local processing of food products

All leading to improved living conductions for rural communities:

- Higher incomes
- Better technical skills
- Work and live in their own land



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However, this sector (AMIS) is neglected or rarely recognized:

- ✓ There are less than 100 industrial or semi-industrial companies for which agri-machinery and equipment are the main products.
- ✓ These were mostly established during the period 1950-1972.
- ✓ They employ less than 1% of the total industrial labor force.
- ✓ The market represents \$1.5 Billion annually, but less than 10% is supplied by local producers.
- Exports of finished products or components are virtually unknown.
- ✓ Face small local markets whose demand limits the scale on which they can operate.



Africa depends mostly on imported materials and machinery with limited value added.





A sector in crisis:

- ✓ The use of tractors in Sub-Saharan Africa has declined by around 70% in last years.
- ✓ Basically considered as an input among many others (fertilizers, seeds, etc.) no attention is paid to required services.
- ✓ Lack virtually all the service facilities necessary for its development: Financing, R&D support; qualified manpower; parts; etc.



Currently AMIS in Africa is in such poor shape financially and technologically that even its own survival is in doubt.



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Other economic realities:

- In the long run most African countries cannot afford to import equipment in the quantities required to meet the social and economic goals of their rural areas.
- The tendency for outside suppliers is to be more interested in supplying what is convenient and profitable to them rather than what is appropriate for Africa.
- The outside suppliers will rarely identify sufficiently with the real needs of the rural market in Africa.
- The technology gap is rapidly increasing.



Fundamentally, mechanization must largely be based on the output of Africa's own AMIS





OBJECTIVES:

- Identify and analyse patterns of development in the AMIS in Africa.
- Formulate development strategies with the aim to contribute to foster the growth of AMIS and the productivity of the agricultural sector.
- Identify groups of countries with similar needs, strengths and weaknesses in order to rationalise the provision of development assistance from UNIDO or other agencies.



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A key conceptual difficulty:

Any attempt to build up an indigenous AMIS is at best a medium-term solution.

Africa's problems, in contrast, are immediate:

- ✓ Food aid is needed today to feed the population.
- ✓ Short-term aid undermines, however, the incentives for local production in the long term.



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Can massive injections of capital into modern farming be the solution?

- As a strategy for feeding the people in the cities, it may work.
- ✓ But leaves 95% of the population untouched.



The traditional farmers are deprived of much needed resources:

- ✓ Exacerbating their difficulties,
- √ emphasizing their income disadvantage,
- ✓ and leading, finally to still more migration.



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The way ahead:

It would be unrealistic to expect that short-term measures be stopped.

However, what is needed:

A long-term plan to establish a strong indigenous AMIS

A system approach integrating strategies for agricultural and industrial development....linking agriculture to industry.





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A broader definition of AMIS in the context of the African continent:

Industry must be understood to:

- Comprise all manufacturers (including blacksmiths and craft sector in general)
- Using whatever materials (including scarp steel)
- Using techniques or patterns of organization that are potentially able to respond to demand, and supply Africa's farmers with the products and services they need.
- ✓ The scope of the sector covers design, R&D, manufacturing, distribution and support services at the strategic interface between agriculture and industry.
- Particular attention has to be paid to the man-machine relationship as a determinant of physical as well as economic flows.



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In this context,

 industry must be planned and developed to provide agriculture with equipment it needs for rural industrialization /mechanization.

In turn,

mechanization and equipment of rural areas must be geared to the real needs of the people in those areas.







Methodology for analyzing the present situation of Africa's AMIS: Typological study

- ➤ Identify groups of countries with similar:
- Needs.
- Strengths.
- · Weaknesses.
- > Rationalise the provision of development assistance.



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Methodology – Industrial system approach:

- Analysis of AMIS and its main components.
- ✓ Identify dominant variables and indicators by using economic and technical criteria.
- Run cluster analysis with dominant variables and indicators.
- ✓ Identify the Groups of countries with similar readings in the variables and indicators that characterise components of the AMIS.
- For each cluster, describe the pattern of AMIS development.
- Use the results of clustering, correlation analysis and empirical research to identify the strengths and weaknesses of each group.
- Establish development strategies that exploit the strengths and address the weaknesses for each group of countries.





The variables used for the typology study:

- ✓ The input situation and productive capacity of the AMIS in each country (53 countries).
- ✓ The local industrial environment.
- The demand for agricultural tools and equipment arising from the AMIS in each country.
- ✓ The resources available to the system in which the AMIS operates.
- ✓ Gender issues.
- Other considerations: population growth, health issues, technological trends, agricultural commodity prices; etc.



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Resource-Related Variables:

No.	Description	Unit
R1	Crop Land	ha/cap
R2	Pasture Land	ha/cap
R3	Forest Land	ha/cap
R4	Water Resources	M³/cap
R5	Population Density	Pop./km ²
R6	Rural Population	Rural Pop./000ha agric land
R7	Life Expectancy	Years
R8	GDP per Capita 1995	US\$ constant/cap
R9	Investment	Inward investment as % of NFF
R10	Investment	Inward: Total Investment
	Crop Surplus	Not available
R11	Agricultural Exports	% of total merchandise exports
R12	GDP per capita	US\$ purchasing power parity





Demand-Related Variables:

No.	Description	Unit
D1	Arable Crop Land	ha/cap of the rural population
D2	Irrigated Land	% of arable land irrigated
D3	Crop Production Index	Index on base 1990
D4	Fertiliser Consumption	Gm/ha of crop land
D5	Agricultural Value Added	% of GDP from agriculture
	Holdings	Not available
	Holding Pattern	Not available
D6	Draft Animals	Draft animals/000ha crop land
D7	Tractors	Tractors per ha arable land
D8	Food Imports	% of total merchandise imports
D9	Calory Index	Change, base 1970 - calories/cap
D10	Calory Intake	Calories per capita
D11	Cereal Aid	000mt
D12	Cereal Aid per capita	Mt/cap



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Variables Related to the Industrial Environment:

No.	Description	Unit
E1	Manufacturing Capacity	Manufacturing Value Added per capita
E2	Manufacturing contribution	Manufacturing value added % of GDP
E2a	Industry's contribution to GDP	Industrial value added % of GDP
E3	Manufactures Exported	Share of manufactures in total exports
E4	Debt: Export Ratio	External Debt Service to Export ratio
E5	Transport Capacity	Vehicles per 000cap.
E6	Secondary Education	% Enrolment in secondary education
E7	Adult Illiteracy	% Illiteracy in adults over 15 years
E8	Female Illiteracy	% Illiteracy in females over 15 years
E9	Paved Roads	Paved roads as % of all roads
E10	Agricultural Roads	Road network (km) per 000ha crop land
E11	Communications	Telephones per 000cap.
E12	Credit	Private sector credit as % of GDP







AMIS inputs:

No.	Description	Unit
I1	Labour in Agriculture	% labour force in agriculture
12	Labour in Industry	% labour force in industry
13	Females in Education	% females in secondary education
14	Electricity Production	KWh per 000cap.
15	Energy Self-Sufficiency	% of energy imported
16	Metal Imports	Un-manufactured metals mt/000cap
18	Fuel Imports	Fuel as % of merchandise imports
19	Fuel Price	Price of Diesel oil US\$/litre
l10	Foreign Investment	Net foreign direct investment US\$/cap

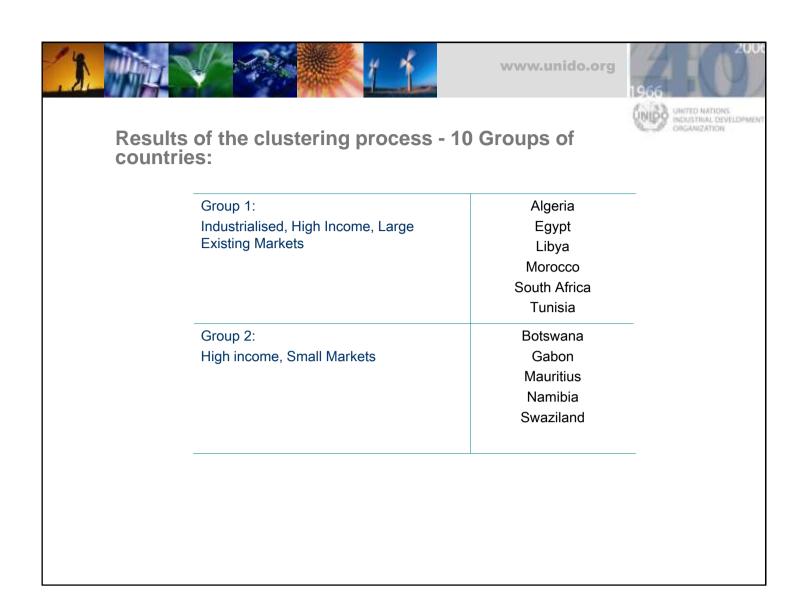


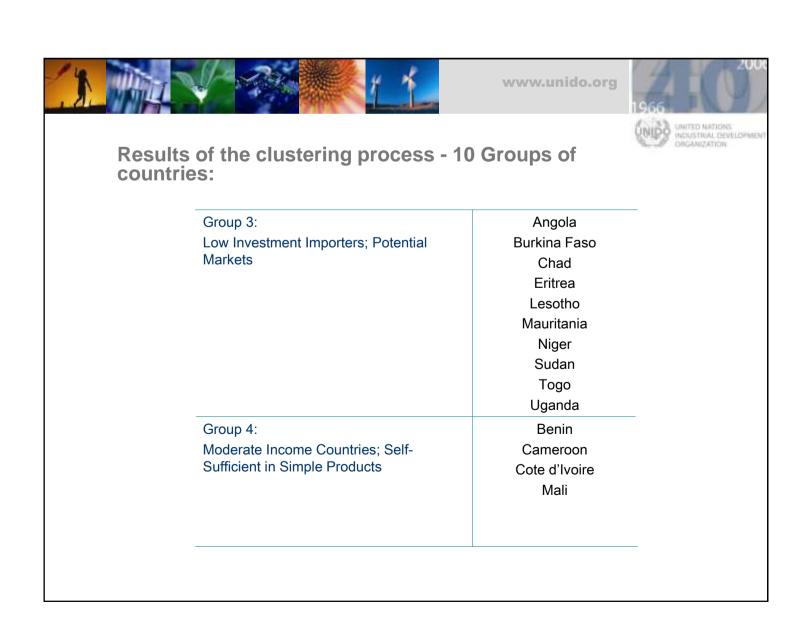
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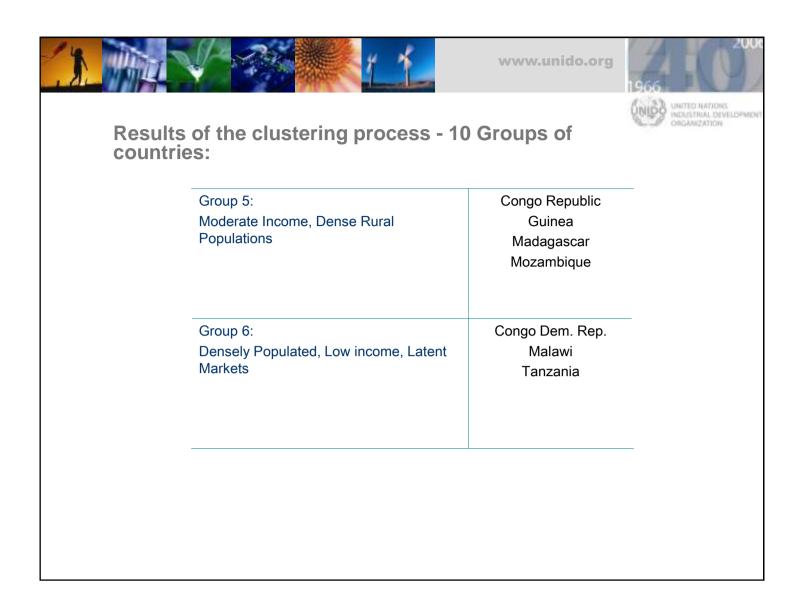


AMIS capacity:

No.	Description	Unit
C1	Mainly a Machinery Importer	Main present source of AMIS products
C1a	Stamping Facilities	Presence of stamping/forging
C2	Machining Facilities	Presence of machining
C3	Casting Facilities	Presence of foundries
C4	Hand Tool Production	Scale of production *
C5	Animal Draft Implements	Scale of production *
C6	Powered Machines	Scale of production *
C7	Manufacturing Value Added	Metal Manufacturing MVA/000cap.
C8	MVA Growth	Index, base 1990
C9	Tractor assembly/Manufacture	Presence of assembly/manufacture







Results of the clusterin countries:	g process - 10 Group	os of
Group 7: Large Markets, Good	potential	Ethiopia Ghana Nigeria
Group 8: Semi-Industrialized, G	Good Markets S	Kenya Senegal Zambia





Results of the clustering process - 10 Groups of countries:

Group 9:	Burundi
Small, Low Income, Agricultural	Central African
Economies	Republic
	Liberia
	Rwanda
	Sierra Leone
	Somalia
Group 10:	Cape Verde
Small Populations, Small Markets	Comoros
	Djibouti
	Equatorial Guinea
	Gambia
	Guinea Bissau
	Sao Tome & Principe
	Seychelles



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Common development strategies:

- ✓ A suitable institution should be identified to take on the responsibility for development of the AMIS.
- Ensure that the national programme for AMIS products is aligned with both traditional and newly developing needs for tools and equipment.
- ✓ Work closely with the food industry to develop and market equipment to support the diversification of crop use and expand opportunities for industrial development.
- Foster development of the artisan producer and promote the transition from artisan to SME.
- Evaluate industrial production plans on the basis of real demand and integrate production within an existing metal-manufacture sector.
- Exploit potential for diversification in the interests of rational production economics.





Common development strategies:

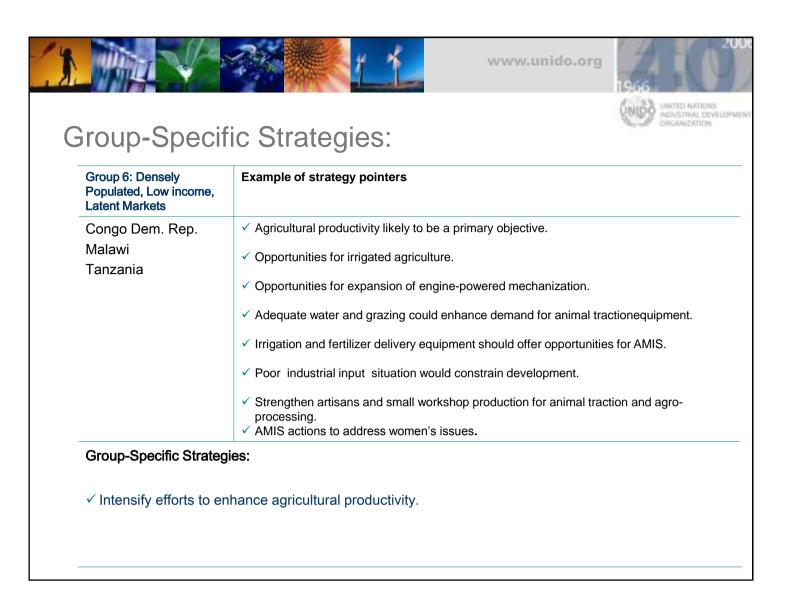
- Evaluate existing distribution and service support set-up and assist where necessary to induce improvement.
- Improve communication and gain access to worldwide sources of information. It is suggested that an African AMIS Intranet is created.
- Continuously assess the policy and infrastructure in which AMIS operates, identify constraints and promote corrective measures.
- Assess the potential role of whatever regional bodies exist and explore the ways in which they might influence the development of the AMIS.
- Examine the role of women in order to research the market for equipment specifically suited to them and to plan production of such equipment.



✓ Explore opportunities for foreign investment in the AMIS.













Group-Specific Strategies:

Group 10: Small Populations,	Example of strategy pointers
Small Markets:	
Cape Verde, Comoros, Djibouti, Equatorial Guinea, Gambia, Guinea Bissau, Sao Tome & Principe,	 ✓ Limited opportunities for industrial development. ✓ Potential demand for AMIS in some countries. ✓ Input situation is favourable in some countries.
Seychelles	✓ Indicators suggest a role for women in small industries.

Group-Specific Strategies:

Import most AMIS products and strengthen distribution system.



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Conclusions

- There is urgent needs to develop the African AMIS, but this will require at best a medium-term solution.
- Given current global trends, Africa and its major donors must recognize two issues:
 - √The importance of agricultural machinery as an essential input
 - ✓ The need to source this input largely at the local level
- International organizations, donors, and suppliers will have to play a lead role in setting AMIS into motion to contribute in achieving the MDG's

