SLE

Centre for Rural Development (SLE)

RURAL TRANSFORMATION IN AFRICA

Scenario Building Workshop in Zambia

19 - 23 October 2015, Documentation

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Table of contents

Introduction

The report below contains the proceedings of a first scenario building workshop on "Rural Transformation in Africa" within the frame of the German funded special initiative "One World – No Hunger". The workshop is the first in a row of three workshops to derive scenarios in the three countries of Zambia, Benin and Ethiopia.

Within a preparatory mission in July 2015, potential participants of the workshop were identified. A broad variety of participants should represent the views of different sectors but also of different kind of stakeholders such as governmental authorities, research organisations, private sector and civil society.

The scenario building workshop was hosted by the Centre for Rural Development (SLE, Humboldt Universität zu Berlin) which has more than 50 years of experience in the field of rural development and transformation processes at global scale. The workshop was held from 19 to 23 October in Lusaka.

The objective of the overall research project is to derive recommendations and measures that will contribute to a socially more inclusive and ecologically more sustainable rural transformation in Africa. Recommendations will be provided to the German Federal Ministry of Development and Economic Cooperation.

Workshop overview

The workshop was officially opened with a key note from the German Embassy providing the background of the research project and pointing out the importance of agriculture for economic and social development and the efforts made by the German government to fight hunger and poverty.

A quick audit revealed that most of the participants had never gone through a scenario building process and the facilitator presented the steps of the following five days.

The facilitator embedded the programme of the five-day workshop in the whole research concept which includes a second phase – following the workshop – to underpin, strengthen and enhance the results of the workshop by interviews with stakeholders in the North Western and Central province. The research team will share the results with the German

and Zambian government, with participants of the workshop and other important stakeholders to allow the consideration and implementation of adapted measures and strategies according to the research results.

Part 1	19/20.10.2015	Step A-D	21 participants
Part 2	21-23.10.2015	Step F-I	12 participants

The logical structure of the workshop can be described as follows: the workshop consisted of two major parts. The **first part** during the first two days was dedicated to elaborate linear (straight-line) scenarios. To include a broad range of perspectives, information and experiences in the discussions, 21 experts from various backgrounds were invited to participate. The results of this part are the scenarios presented in Step D (see page 24).

The **second part** took place during day 3 to 5. It was dedicated to elaborate the systemic model of rural transformation. The steps were followed with 12 participants who already participated in the first part of the workshop (day 1-2) and represented a valuable mix of various backgrounds and expert knowledge ranging from public and private sectors to academia and civil society. During the second part, the formerly identified factors were analysed against their influences on other factors and their sensitivity to changes in the systems as can be seen in Steps F and G. The elaborated system of driving factors for rural transformation in Zambia led to the developing of strategic recommendations in Step I.

Introduction of method and concepts

Scenario-building

In the context of this research project, scenario building is defined as a strategic planning procedure that presents several plausible future paths of rural transformation. It further allows identifying and assessing the influence and interactions of key driving factors for rural transformation. Scenario-building allows drawing development pathways that lead from current trends to the desired future path of rural transformation.

The appropriate time horizon for scenarios depends on the pace of development of the issue considered and the driving forces behind it. For the question of rural transformation a time horizon of 15 years (2030) was considered.

Scenarios project several possible pictures of the future. Unlike forecasts based on trend extrapolation, they do not predict what will happen but tell us what could happen within a certain probability space over time.

Rural Transformation

The topic of "Rural Transformation in Africa" is very broad and was therefore narrowed down to the following definition:

> Rural transformation is a long-term, multi-dimensional process of change affecting the basic characteristics of livelihoods of people in rural regions, taking into account their interaction with societal and global dynamics.

Change processes include inter alia demographic dynamics, migration, privatization, decentralization, ecological changes. The SLE then introduced the concepts of ecological sustainability and social inclusion.

Major discussion points on ecological sustainability

- The workshop comes at the right time as Zambia wants to diversify the economy towards agriculture and tourism.
- The workshop should not only look at agriculture but at ecology as a whole as it sets the base for agricultural production.
- More than50% of employment depends on agriculture. But there is little understanding about recent developments and about the question whether current practices are sustainable. As an example, it is important to raise the question how agriculture, poor rainfall (climate change) and crop production are interlinked.

Major discussion points on social inclusion

- It is important to capture social aspects in rural areas.
- Most of governmental efforts do not seem to create expected impacts because policies and legislation that are currently in place tend to exclude certain section of communities.
- In some cases, communities are not aware of their rights, do not have the capacity to appreciate their rights and therefore do not demand their rights.
- Land is easily accesible to everbody and therefore it is not a question of discrimintation by law but more a problem of information sharing. Access to information is however also exclusive because of language barriers, lack of education, lack of tructures etc.
- The discussion also evolved around: access to markets, the role of gender empowerment, social protection and project implementation.

Step A: Rural transformation in Zambia: Recent trends and social and environmental impact

Seven working groups were formed to identify and discuss recent trends in rural Zambia. The following presents results by topic.

Economic trends (incl. trends in agriculture)

- We are going to experience negative economic trends as can be seen in the currency fluctuations, big budget deficits, high import dependency and collapse of copper prices. This has implications for the rural community. With a budget deficit the government will not be able to afford fertilizer to distribute in the rural communities – the government plays a big role in distributing inputs. If government withdraws from the market, it encourages the private sector to fill the void and invest in the market. This is a chance for diversification, to other crops like beans or to encourage livestock more. With this diversification, the market could run better.
- If government withdraws from the maize market it might be an opportunity for an overall change of trends. It will also impact diversification. To diversify economy from the copper and going into agriculture is an ongoing process.
- In general, there is low agricultural productivity. Costs for inputs have increased and therefore we do not expect increased productivity. There are some initiatives to improve livelihoods of rural communities, but they are not sustainable.
- People are moving from traditional to more modern practices (slash and burn to conservation agriculture). We expect farmers to diversify crop production but also go into livestock and fishing to minimize production risks.

- There is a trend towards small-scale mining activities. Their presence has an impact on the environment. The tools are very traditional and make the work dangerous. Also it destructs families as husbands have to move to the mining sites.
- Government and NGOs encourage diversification such as cattle farming, fish farming etc. This leads to mechanization of agriculture (ploughing) and we do not have to rely on traditional tools anymore.
- There is an increase of private sector companies in agriculture: Traders come to buy maize but there are also milk collecting points. This encourages cattle rearing.

Environmental trends (on forests, soil fertility, and climate change)

- In general, higher extraction of natural resources and displacement of biodiversity is expected.
- Deforestation has been a problem for a while. Due to the negative economic trends, charcoal is used more than ever. We have seen droughts and erratic rainfall while our energy and power sector is in crisis. These are results of climate change.
- There is a trend to reduced rainfall and unpredictable rainfall patterns, some communities experience droughts. This is impacted by the infrastructure development trend (road construction and cutting trees).
- Deforestation is quite scary in some areas and linked to agriculture and charcoal production. There is increased demand for charcoal to fill the gap in energy provision. This is accompanied by deforestation which negatively affects the whole country.
- There is a new forestry act in place to promote and enhance a more participatory management of forests and to foster conservation and protection.
- Soil fertility has really gone down. Making these soils productive again is a big challenge in the rural areas.

- Most rural people are now using fertilizer, but mostly lack the know-how to make soils more fertile. This creates a danger.

Social and demographic trends (incl. consumption patterns)

- There are links between social trends to the environment and economic situation. We expect deterioration of social indicators. Life expectancy might drop because of the economic crisis. Improvements in access to health facilities might go down because government has limited budget. Same holds for access to school and primarily education. They fail to recruit teachers in the rural areas.
- Creating schools and university will allow rural communities to access education and literacy.
- Population growth remains high. Making them productive is one challenge.
- The increased use of phones will help to educate children.
- New corridors are a positive development. But they are also places where many truckers will park and engage in sexual activities which will spread diseases.
- There is an increased trend to consume foreign food, especially from South Africa. Other things we buy from china. The domestic market is already bad, small-scale farmers lack negotiation skills and the quality cannot easily compete with imported goods. This consumption trend negatively affects rural producers' livelihoods and has to be addressed.
- Urban communities exploit rural communities to have cheap access to land, forestry, charcoal, food, labour. This inflates prices in the rural areas and leads to continuing poverty cycles, environmental degradation and displacement of rural communities.

Institutional trends

- Opening up and creating new districts (e.g. from 6 to 16 districts in the western province) brings difficulties to connect communities. New roads are being built.
- Improved land use planning in districts where business centres are established. Waste management in established cities will be a huge challenge as there is more and more plastic. We need strategical environmental assessments.
- Some cultural values of the communities, e.g. early age marriage are restricted by policies. The impact on the norms of rural communities seems positive. There are gender policies to promote equality and to empower women.
- Decentralisation is backed by the government. Management of natural resources will then be done through the local authority. Information will be more easily to share at district level (e.g. gender empowerment and rights).
- Once rural transformation has taken place, we will be receiving remittances from rural areas.

Infrastructure: energy, communication, roads

- There are positive trends towards new technologies in the energy and communication sector. In energy, there is a movement from biofuels to solar energy. This improves livelihoods according to the SDGs and means less physical work and less deforestation. In communication, we observe a strong literacy-seeking tendency accompanying the increasing use of mobile phones – people want to acquire these skills to use the phones. There is also an increase in use of communication technology to disseminate information like the weather forecast (government sends forecast to farmers) or ZILMIS. This leads to improved livelihoods due to informed decision making.
- Access to cell phone and internet rises. This allows access to financial services and loans for farmers. New methods to grow more sustainable and the use of eco-friendly crops are promoted.
- Communication is on the rise. Even remote areas are able to communicate.
- The spread of community radio stations is helping to reduce information poverty in rural areas.
- Housing structures improves as more and more houses use iron sheets.
- The penetration of roads increases and with it the transportation possibilities to rural communities. However, this also has environmental effects and impacts climate change (cutting of trees).
- More roads are constructed. This will have a positive impact on the farmers.
- The expected massive infrastructure development will translate to transform rural communities. There will be better access to quality health care and the healthy rural population will enhance productivity. The Link Zambia 8000 project is a positive sign from the government and allows communities to move more easily.
- Ease of access to goods and services.
- If we have a rail line between North-Western Province and Angola, this will fuel the rural communities around and promote jobs.
- But: improved infrastructure goes along with environmental degradation.

Step B: Identification and definition of factors determining rural transformation in Zambia

Within a brainstorming process, more than 30 factors were identified to determine rural transformation processes in Zambia. The following will provide and explanation to why factors were considered as important.

Biodiversity (*Existence of rich biodiversity = species in quality and quantity in the village*); important because:

- Biodiversity is the base for human economic and social activity.
- We need a balance in the ecosystems (quality and quantity of species).

Rural infrastructure (*Roads, banking facilities, service facilities*); important because:

- With the construction of roads, schools and other facilities, welfare of rural communities can be improved. If roads are there, farmers can reach markets and if someone wants to invest in the community, they can easily reach it.
- Infrastructure entails physical and social infrastructure, e.g. road network, communication, market infrastructure, social networks, capital, schools and hospitals. It falls under sustainable infrastructure for rural development.
- Infrastructure promotes access to health centres, bringing produces to other places, reaching shopping centres for accessing other products but also labour mobility.

Policy framework; important because:

- Better monitoring and evaluation is needed.
- Almost everything discussed is coming back to policies. They must be good and it is important to formulate policies that are favourable to the rural population and not only Lusaka dwellers. This has been neglected to some extent
- There is confusion which policy we should follow: the plan, the manifest, the program etc. This has to do that new governments don't follow the long term goals.
- Policy framework should be broken down to specific policies e.g. agricultural policy, economic policy, environmental policy.
- There is some policy inconsistence, and sometimes policies conflict each other. For instance, the Ministry of Energy wants to promote bioenergy production but this is blocked by the Ministry of Agriculture because they have other priorities.
- Policy implementation is a further problem. Zambia has very good policies, but the implementation is extremely poor; how to plan and implement the policies?

Entrepreneurship; important because:

- Requires a different set of skills that stands on its own.
- Entrepreneurship can also be part of culture.

Local governance issues; important because:

- Local governance includes the traditional leaders. There is a lot of inconsistency between the traditional and modern system.
- The role of traditional leadership is not consistent and depends on the chief himself. It can be positive and negative when the chief is the main influencer.

Gender; important because:

- Gender policy: women are the main producers and they are important economic players.
- There are biases against women which have to be changed.

Reproduction and family planning; important because:

- In rural areas households often have 5-6 children. Therefore it is difficult to enfold livelihoods and to overcome poverty.
- This factor could also be part of the social protection system.
- The culture is changing towards having 2 rather than 5 children.
- In rural areas, families with many women and children are better off (social protection).

Education for social and human development (*Knowledge on technical, financial, economic, social and natural aspects*); important because:

- Education and literacy skills should be combined. Formal and informal education both has a purpose and promotes social development.
- This also includes knowledge and skills used in agricultural production).
- Our labour force needs skilled labour.

Information flow and quality; important because:

- Knowledge on all the aspects we are discussing is not reaching the people in rural areas. Sometimes it is even contradictory. This is the case when different organizations go in with different information on the same issues.

Social protection system; important because:

- Social security issues are becoming real, disabled and elderly receive 50 kwacha every 2 months.
- Informal social protection systems are also in place, for example taking care of children when working somewhere else.

Production practices; important because:

- Main problem of rural communities is that they are not producing enough.
- We need to improve productivity. Then communities can move to a stage where everyone has a better life.
- How much can be produced and how much is produced are two different things.
- Another aspect is that of loss of value because it is not further processed.
- We need also to look at skills when speaking about production practices.

Weather variability/climate change (*Change in weather patterns coupled with global warming/ Instability in the occurrence of weather patterns -original definition: early warning system)*; important because:

- Connecting it to experiences of floods and droughts that affect the rural communities.
- A lot of examples as the Southern parts are experiencing dryness.

Agricultural diversification; important because:

- Very important for rural areas to diversify as it widens the productive base and thereby generates more income

Soil Fertility; important because:

- Land is there, but it is not fertile, so people move from these places.

Access to land / Availability of arable land (*Availability of land suitable for farming and other agricultural uses such as livestock*); important because:

- In Lusaka land is given out for construction, no land is available (also true for some rural areas).
- Intensely debated was the question whether availability and accessibility of land is restricted. It is estimated that only 10% of the land is used for agriculture. There was a dispute whether chiefs abuse their power to allocate land and discriminate some social groups like women and youth. Obviously, this depends on the integrity of the chief.
- Foreign land investment is not seen as a problem as there still is abundant land.

Mining industries; important because:

- Enables population in rural areas to have access to jobs, they are able to participate in the production of mines

Management of natural resources (*Afforestation, fishing methods etc. / Sustainable use of natural resources*); important because:

- Untapped natural resources are becoming rare.

Smallholder productivity (*Quantity produced per unit area/carrying capacity of crops and livestock respectively*); important because:

- Low productivity is one of the biggest problems.
- Discussion points: Does this also include livestock productivity? There is a trend for smallholders to diversify. However, if you improve the pasture, you can also measure it in productivity per unit area.

Business opportunity/Enterprise diversity (*No of enterprises types engaged in by people / Potential Money Making Ventures*); important because:

- Lack of enterprises where people can engage.

Culture (*Attitude how to respond, plan and do things*); important because:

- Culture has a huge impact on how we may transform. It is cultural to accept situations like they are, or accept government as it is.
- There are certain areas where culture has a positive or negative impact. In terms of marriage for example, parents used to take girls out of school and marry them off. This is accepted and it has an impact on their skills and on their future. Also, the use of condoms in married couples is still difficult.
- Discussion on responsiveness of local culture to change

Prices of agricultural products and prices for agricultural inputs; important because:

- Prices of agriculture inputs might not directly be related to policies. It seems more appropriate to use "access" rather than prices. Price is very specific and influenced by many other things than policies.
- Prices are a factor to determine the access.
- Government prices are conceived as too low.
- The prices at which rural farmers sell their produce are lower because of the middle men. They buy at a very low cost because farmers do not have bargaining power.
- The gross margin differs between 13-25% (difference occurs from differences between region). When discussing with government the prices, government said that productivity is very low. When we increase productivity, the small-scale farmers would make more money. In other businesses, business men make up to 300 %. We fight for 75 Kwacha per bag (maize) but the government sets the price. Before, private sector buyers would buy much below the government prices. But now private buyers come up to 75 Kwacha and farmers sell to them because they made the experience that government would not pay at that time.
- When traders are buying at farm gate there is no addition of transport cost. Farmers do make some profit, even at the farm gate. To generalize low prices would not be correct.
- The one crop that has a huge impact on rural household is maize. On maize the distortion arises from government involvement and setting of prices.
- If we talk about rural transformation, we should look at crop diversity. Let us not focus on the maize story. There are different commodities like soy or cotton that are important. Farmers are coming up with cash crops such as soy beans, means that there are new options for farmers to diversify and to move away from the maize dependency.
- What is lacking is a strong cooperative movement to improve bargaining power. Unfortunately, farmers sell individually and the private sector is taking advantage and exploits the farmers.
- Bargaining power should be part of the variation.
- The prices offered by outgrower companies are not attractive.
- Farmers are making a margin at farm gate because they use subsidized fertiliser. Those farmers who buy fertilizer themselves do not make a margin.

Social capital

- Does the concept of social capital also include social networks?

Youth Policy; important because:

- Shall be changed into Youth Empowerment. That includes skills and the opportunities to generate income.
- In the current state, youth empowerment is low but efforts are being made to improve the situation. It is a challenge, because of the fast growing population and limited capacities and financial resources.
- Major point of discussion was the question whether employment does automatically lead to empowerment.

Access to water; important because:

- Access to water is becoming an issue only in the last 2-3 years.
- Discussion, whether water includes the aspect of drinking water. Agreed, that drinking water is included in the health aspect and here only the aspect of water for productive use is regarded.

Health and Wellbeing; important because:

- Includes also the aspect of not having access to proper sanitation. The absent of sanitation can cause diseases. That is why in rural communities is a high prevalence for diseases.
- Zambia has made great progress in the health sector as they were a lot of interventions. Social insurance is budgeted and there will be more access and less financial barriers

Demand for rural products (*Demand for charcoal, food and other products from rural areas*)

Deforestation (*Loss of forests*)

Market availability (*Access and linkages to markets; Existence of buyers and sellers for goods and services in a certain locality or geographical location*)

Availability of labour (*Availability of rural labour force; Human resources for agriculture and other productive work*)

Financial Services/access to credits (*Access to credits; availability of affordable financial assets, loans etc.*)

Land tenure system (*Land access / land ownership*)

Farming methods (*e.g. use of conservation agricultural farming methods*)

Labour mobility / movement (*Ability to move from one place to another, from one career to the other; Movement of workers from one place and one occupation to another*)

Availability of inputs (*Inputs of production for goods and services / Tools and machines used in agriculture*)

Step C: Weighting and filtering of factors determining rural transformation in Zambia

During this step, all factors were ranked according to their importance and their certainty. The result of the ranking can be seen in the next picture.

Only 4 factors were identified to fall into the quadrant to the top right (very important and highly uncertain). An intense debate startet whether this result reflected reality. During the debate some factors were moved to the top right quadrant following the common sense principle. Main arguments for adjustment include the following. The top right quadrant contains the "drivers" for rural transformation and is therefore of great impotance.

Youth empowerment and education/practical knowledge

- The factor of youth empowerment was considered as relatively certain (scored 4 points). During the discussion youth empowerment was considered to be very important but not that certain as previously indicated. The coverage of empowerment and education has increased, yet focusing on access and less on quality.
- Theoretical skills and theoretical education improve, but not practical training (e.g. for students there are no internships). Practical skills are very uncertain. The majority of universities are in urban areas, which poses the question if rural people really learn the same or rather only what is adapted to their community (ex: King George College in Kabwe).

- We define "level of education" as to what the person knows and the skills he or she has learned. Also, education comprises of formal and informal education. The students should be skilled and have learned competences that are useful to the economy. Today it becomes very difficult to apply the things you have acquired from formal education. Students are complaining that they cannot find internships and companies are complaining about the costs of training for interns. You have to be very vibrant.
- In the rural area, different skills are relevant to survive.
- The education that is going to affect rural transformation is not necessary the education given in certain localities. We have to remember that we talk about education overall and if you go to a rural college, you are not condemned to stay in that area. You can move anywhere you want to.
- There was a disagreement about the level of education today. Some argued that levels went up in the last years and are likely further going to improve; some denied and stated the contrary.

→ Practical skills are not so certain (are less certain than formal education) and the two factors get shifted to the drivers' quadrant.

Soil fertility

- Seems misplaced as agriculture heavily depends on it. It should have come out as a very important factor. The actual result is surprising.
- On the other hand, it might be covered under sustainable management of resources: the problem was to treat the factor separate in the first place.

→ Stays where it is.

Access to water

- Access to drinking water will improve, but access to natural water bodies will most probably reduce. There are efforts being made, but the costs are very high and we do not know how sustainable the funds are.
- Even if Zambia disposes about abundant water resources, water levels are getting lower and lower. You find people shift to areas with water.
- We experience power cuts because the water level in the Zambezi River is low. But, we are still much better off than some of our neighbouring countries. However, the outages should be an indicator that water is running low unless something is done. We claim that we have 40% of the natural water resources but can we really be sure about that?

→ Access to water is moved to the drivers' quadrant.

Health Status

- Health is in the middle of the quadrants, can it move somewhere? Agreed is that it is very uncertain and very important because of the different factors that it is composed of.
- Health status is a very key component in level of productivity.
- Health is the most important factor amongst all because at the end of the day, health is the one that counts.

→ Moves to the drivers' quadrant.

Access to land

- Access to land is being regulated trough policies. It is therefore certain how things will evolve – they lie within the control of the government.
- The way in which local chiefs react to land policy is highly uncertain. They will have to decide today in which way they want to behave in the future.

- Right now we are developing our new constitution and access to land has come out as big issue amongst traditional leaders. They don't agree with the proposed constitution. They want to keep the absolute power towards the land. We can see the situation that traditional leaders sell land that they are not allowed to sell and giving out land titles or prohibit people to access land titles. At the moment, access to land is very open. But it depends on the constitutions where we are moving and who will give out land.
- There is plenty of land to give away, how it will be distributed depends on who has power.
- Sometimes when we discuss land we discuss from the formal side. When you go to the community there are various rules (matrimonial or patrimonial) that you have to follow. This customary system is certain.
- Access is very open but the way the regulations are being upheld by the government or the traditional sector is very uncertain because there is much conflict between the players. Majority of people are denied access to land under actual conditions.
- Land is subdivided, so what is certain is that access to land will diminished over time. If you go to the area today you will find that the majority land is owned by one family. My grandfather's farm size will diminish over time. We can predict that access will continue to diminish. In this sense, the factor is certain.

→ Stays where it is.

Prices of agricultural products

- Highly uncertain, deserves to move up

→ Moves to the drivers' quadrant.

Sustainability of Management of NRM

- This factor is a given, the level of management is rather certain. On the other hand, it depends on the level of improvement of rural livelihoods. As long as the people work only to survive, the level of sustainability is unsure.
- There is always a conflict between natural resource management and the movement from a developing to a developed country. It is uncertain if Zambia signs international declarations and implements them or if they just sit down and do nothing.
- We have just passed the SDGs and there are programmes in place that ensure that we use natural resources sustainably. It is being taught in school, at least theoretically.
- Sustainability and management of natural resources is affected by so many other factors. You cannot predict how things are going to evolve.

→ Moves to drivers' quadrant.

Deforestation

- Deforestation is seen as certain and the factor can thus stay where it is.
- The current deforestation rate is 140-170.000 hectare per year. A new report should be out in November. Schools and others are serious and are replanting. At the moment, the natural forests have the capacity to recover. And even if recovery rates slow down, we know the pattern: we will lose more natural resources and this is certain.

→ Stays where it is.

Weather variability

- Weather variability itself is a highly uncertain factor, but it is certain that the variability will continue or even increase. In that sense, the factor is certain.

→ Factor moves from uncertain to certain.

The final result of the discussion is presented in the picture below.

The following definitions were agreed on for the 10 identified driving forces:

Driver	Working-Definition of driving factors
Access to water	Availability, affordability and reliability of water for economic production including irrigation, energy, industry
Access to energy	Availability, affordability and reliability of energy for productive and domestic purposes
Prices of agriculture products	Average farm gate prices of crop, livestock and fisheries products. In average prices (money or in kind) *This is understood in a wider system as there are also barter systems in place. In this case, we think that even the exchange of products can also be explained in monetary system*.
Access to agriculture inputs	Availability, affordability and reliability of seeds, feed, drugs, chemicals, fertilizer. *This excludes "labour" and "capital" from inputs. We look at inputs in a narrow way*.
Access to financial services	Availability, affordability and reliability of credit, savings, sending, insurances
Practical knowledge and skills	Level of literacy, artisanal, technical, entrepreneurial and agricultural skills and knowledge
Health	Level of physical and mental well-being of people.
Youth empowerment	Opportunities to participate in the economic and social decision-making and activities of 18-35 year old Zambians. *It depends on skills for self-employment, literacy, practical skills. It also depends on access to finance and information*.
Sustainability of natural resources	Stewardship/management of natural resources in a sustainable way
Smallholder productivity	Output/ unit in crop, livestock and fishery production.

Step D: Describing variations of factors

During this step, different scenarios have been developed:

Variations of the factors (drivers of rural transformation in Zambia) and scenarios:

Most probable scenario: more or less continuing the current trends)

Best case scenario

Worst case: orange: Not discussed in plenary, simply a combination of worsening variations

Factors	Variation A	Variation B	Variation C
Access to agricultural inputs	**Current**: Supply continues to be irregular and unpredictable, coming at wrong times. In some places, supply is unreachable	**Improving**: There is affordable, easily accessible and timely supply of agro-inputs.	**Worsening**: Access is increasingly limited, as prices increase and supply is poor
Access to financial services	**Current**: Financial facilities are available, but distant and inadequate. Financial services are inadequate	**Improving**: Access to financial services (mobile money and banking, etc.) is improved	**Worsening**: Access to financial services is limited further. Higher interest rates discourage potential borrowers
Access to energy	**Continuing**: Access to energy continues to be poor. Most households have no access to electricity.	**Increasing**: Investment in various energy sources improve access to energy An increased number of rural households has access to electricity	**Worsening**: The dependency on wood-based fuels increases. Deforestation reaches critical levels
Prices of agricultural products	**Current**: (Low?) farm-gate prices make it difficult for farmers to meet their basic needs	**Improving**: Cost-reflective prices spur production and improvement in agro-products. Increased bargaining power and diversity of crops allow farmers to realize better prices overall	**Worsening**: Farm-gate prices decline further. Farmers are discouraged from participating in agriculture
Sustainability of natural resources	**Current**: Harvesting of (wood) forest products continues to increase. Clearance of forest (for mining, farming, through road and settlement construction) is	**Improving**: National tree planting programmes lead to forest restocking Fish restocking programmes and aquaculture promotion lead to more sustainable	**Worsening**: Desertification is eminent and landscape is destroyed beyond restoration Loss of biodiversity leads to the extinction of species, depletion of stocks, loss of soil fertility and increased

	increasing. Underground water is being tapped. Watershed disturbance continues to be high (construction, mining) Soil fertility depletion continues unabated (bad agricultural practices, overuse of chemicals Encroachment on and poaching in national parks is increasing Exploitation of minerals continues with unsustainable mining methods leading inter alia to pollution Overfishing and bad fishing methods continues to deplete water bodies	use of aquatic resources Restocking of national parks is successful Overall resource management becomes more sustainable through community management of wildlife/national parks, forestry and improved watershed management Mining operations are controlled properly thus reducing negative impacts	pollution (SO_2) Ground water and formerly perennial streams dry up
Youth empowerment	**Increasing**: The youth is increasingly empowered. There are high levels of civic awareness. Governmental and other stakeholders' programmes are implemented.	**Current**: Youth empowerment remains low. However, efforts are undertaken to address negative trends of the past	**Worsening**: Youth empowerment is worsening. A fast growing young population outstrips governmental and other stakeholders' efforts for youth empowerment
Health status	**Improving**: The health status of the population is further improving. People have access to health facilities and drugs.	**Current**: The health status of the population remains at current levels. Health facilities are available, but personnel are inadequate, distances are long and medicines are insufficient	**Worsening**: The health status of the population is worsening. Medicine is largely unavailable, equipment is obsolete, as is infrastructure
Level of practical knowledge and skills	**Worsening**: The levels of practical skills are decreasing. The demand for practical skills training outstrips the available training facilities	**Stable**: Levels of practical skills continue to be low. Access to vocational training colleges and to practical training in public schools is limited	**Improving**: The levels of practical skills are increasing. Youth has access to training facilities and has increased awareness of skills that can lead to self-employment
Access to water (for productive	**Continuing**: Most rural households have no access to irrigation	**Increasing**: Most rural households have access to irrigation facilities.	**Worsening**: An increasing number of households has no access to water for irrigation,

purposes)	facilities. They depend on rainfall for agriculture (crop/livestock) production	They reduce their dependency on rainfall for agricultural production.	reducing agricultural production and productivity
Smallholders' productivity	**Current**: Yield per unit area/input of smallholder farmers continue to be below the potential yield of existing crop variety/livestock breed. Compared to large-scale farmers, productivity is low	**Improved**: Yield per unit area/input of smallholder farmers has improved significantly above the current levels. Smallholder farmers adopt improved technologies i.e. use of improved seed varieties and farming practices such as conservation farming, timely weeding and planting and proper use of fertilizers. (best case: more significant productivity increase)	**Worsening**: Yield per unit area/input of smallholder farmers has dropped significantly below the current levels. Smallholder farmers have less access to farming inputs such as improved seed varieties and fertilizers. They cannot cope with weather variability and experience worsening labour constraints

Worsening/ Worst case: "Yazanda" Serious problem!)

Business-as-usual: *"Ifiintu Ta Fili Bwino"* (Things aren't OK)

Best case: *"Ili Che!"* (Cool!)

Step F: Mutual Influences of the Factors defining Rural Transformation

The next step was to analyse how the different factors influence each other. This step was very intense and involved many discussions. The results show and read as follows:

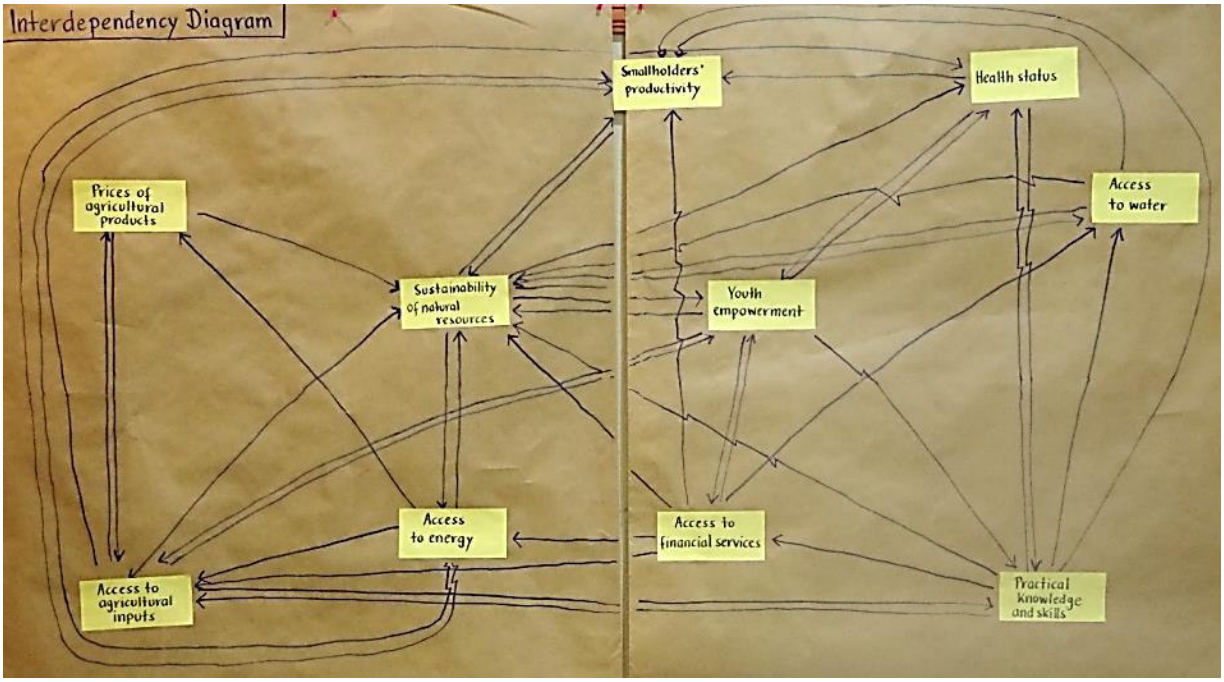
0 = no influence; 1 = influence, but not strong; 2 = strong influence

		A	B	C	D	E	F	G	H	I	K	Active Sum (AS)
A	Access to water	X	1	2	0	0	0	0	1	2	2	8
B	Access to energy	1	X	2	2	1	1	2	1	2	2	14
C	Prices of agricultural products	1	1	X	2	1	0	1	1	2	1	10
D	Access to agricultural inputs	0	0	2	X	0	2	1	2	2	2	11
E	Access to financial services	2	2	0	2	X	1	1	2	2	2	14
F	Practical knowledge and skills	2	1	1	1	2	X	2	2	2	2	15
G	Health status	1	1	0	1	1	2	X	2	1	2	11
H	Youth empowerment	1	1	0	2	2	2	2	X	2	1	13
I	Sustainability of natural resources	2	2	1	1	0	1	2	2	X	2	13
K	Smallholders' productivity	0	0	0	0	1	0	0	1	2	X	4
	Passive Sum (PS)	10	9	8	11	8	9	11	14	17	16	
	AS x PS	80	126	80	121	112	135	121	182	221	64	

Practical knowledge and skills (15), access to financial services (14) and Access to energy (14) are the most active driving factors. Sustainability of natural resources (17) and smallholders' productivity (16) are the most influenced (passive) drivers. See chapter 1.1 to follow the detailed discussion.

Step G: Reviewing the system of factors determining rural transformation (Interdependency diagram)

The results of the influence matrix were transferred into an interdependency diagram where only strong influences (value=2) were considered.



Participants were invited to take a walk through the system by picking one factor as starting point and explain interdependencies with surrounding factors.

Walk through the system examples:

Looking at the interdependency diagram, I will pick **access to financial services** as the starting point of my walk through the system. We assume that better access to financial service will improve also the access to water which in turn has a positive influence on smallholder productivity. On the other hand, access to financial loans will also have a positive and strong influence on youth empowerment because assuming that our youth can access loans, we expect that they will be empowered in their economic opportunities like for example to start a business or a start-up. Access to finance also has a direct influence on smallholder productivity because it allows for ways of intensification as it can be seen for example in outgrower schemes for cotton and tobacco. More farmers are also likely to venture into livestock activities. In a broader way, access to financial services also has a strong influence on the sustainability of natural resources. Through loans you can buy pumps and solar energy systems which in turn will allow us to use natural resources more effectively. Also, with loans you can keep livestock and use their manure as organic alternative to unsustainable inputs. Access to financial services also has a direct link to

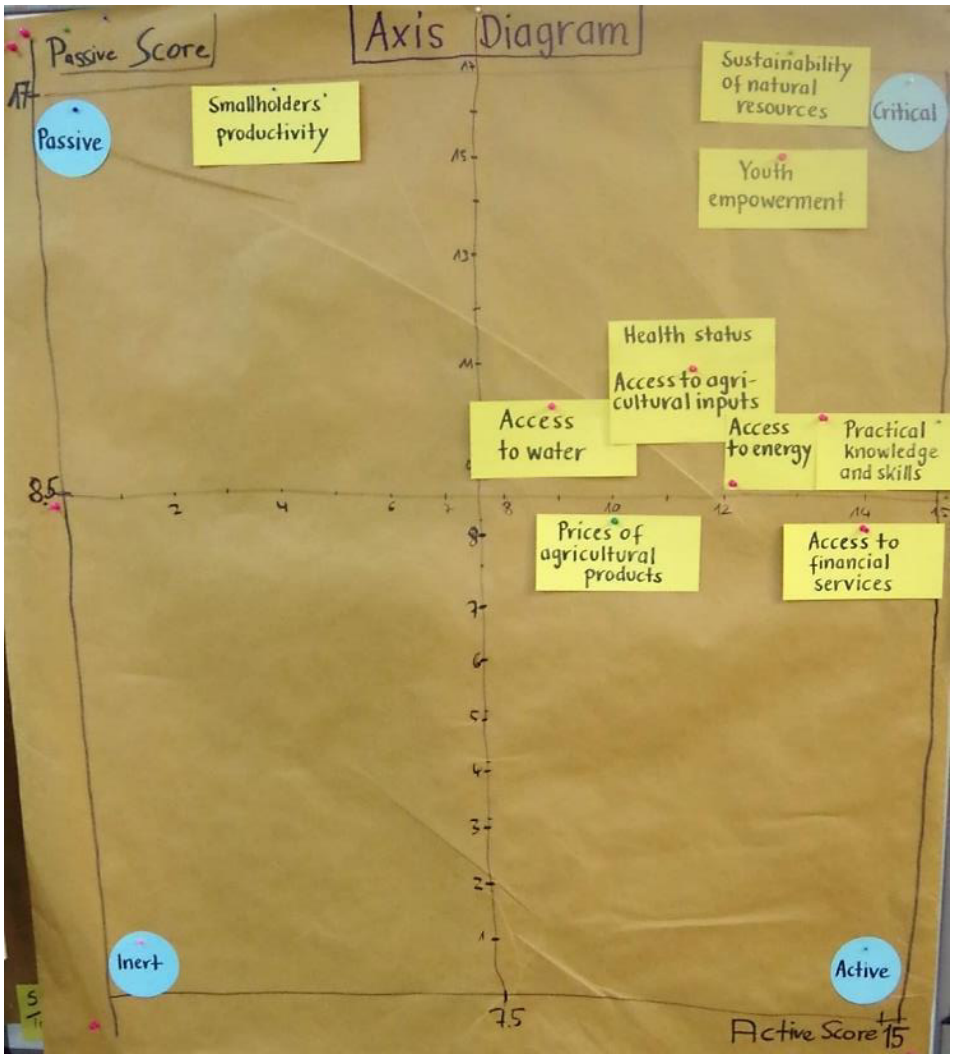
access to agricultural inputs as you will need financial resources to buy inputs. I think that the interdependency diagram is sound and easy to follow.

I will use **health status** as starting point for my walk through the system. We can see that health is an indicator for economic performance and also influences many other factors. The effect on practical knowledge and skills has a good and a bad side: When people are sick, their level of acquiring skills will go down but when they are healthy they will acquire more practice and skills. The effect on youth empowerment is also clear. Employment is one important determinant of health. This means that when you get empowered and have access to awareness raising opportunities you will be able to be more productive or to be an entrepreneur. Similar effects unfold in the case of productivity. So far, agriculture in Zambia is not capital intensive. There is no money to buy machinery, instead it is labour intensive. This requires strong health. With bad health, productivity levels will go even lower.

I will start my walk from **access to energy**. We have agreed that if you have proper energy, your use resources more efficient. But, on the other hand, natural resources are also often used as energy sources so there might be also a negative impact on the sustainability of natural resources. We have discussed about the positive effect of access to energy on agriculture prices. If you remember, we said that with better energy access you can e.g. install storage and cooling facilities and thus realize higher prices. Access to energy also has a positive impact on inputs because with more fuel the transport system will be facilitated. The effect on productivity is also there. With proper access to energy you can run water pumps and thus irrigate more easily. The effect on health is also clear. Pharmacies and hospitals need energy to offer different kinds of treatment and drugs. This is a big problem today.

Step H: Reviewing the system of factors determining rural transformation (Axis diagram)

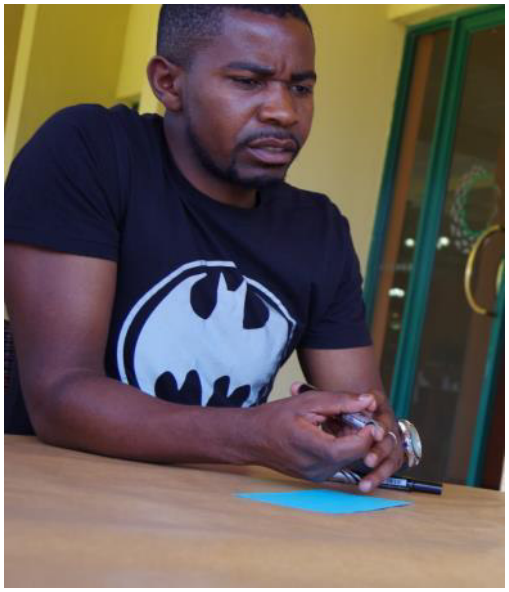
The results from the influence matrix were also transferred into an Axis Diagram based on the calculated active and passive scores. The active and passive scores indicate the extent to which a driving factor has an active influence in the system or is passively influenced by other factors. The picture below illustrates this. "Smallholder productivity" was ranked as highly passive but with low activeness. This translates into the following: Smallholder productivity is highly influenced by other driving factors in rural transformation in Zambia. This means that one has to think of the consequences and effects on productivity when changing one of the other driving factors. Sustainability of natural resources is also highly passive but also highly active. This means that the factor plays an important role in the system. Changes in other driving factors easily influence and move the sustainability of natural resources which in turn easily changes and moves other factors in the system. Therefore it is considered a "critical factor".



Axis Diagram Discussion

The participants highly appreciated this type of illustration and identification of critical factors. It was acknowledged that although the majority of driving factors was recognized by various policies and strategies (e.g. 7th National Development Plan) rural areas were not unfolding as planned. In this regard, some of the issues raised during the discussion include the following:

- No implementation of policies
- Poor monitoring: "Plans are there, but if you do some serious M&E, funding is limited. They don't have the resources they deserve".
- Misallocation of funds: "Resource allocation is not according to the prioritisation during the planning".
- Processes are not participatory: "We do not include the people on the ground".
- Misuse and misappropriation of resources.



Step I: Developing strategies through changes of factors

In the final step, participants were invited to identify key forces, suitable strategic measures and discuss their social and ecological impact.

Access to water

Best case scenario: Most rural households have access to irrigation facilities and as a result reduce their dependence on rainfall for agric. production		
Key forces	**Suitable strategic measures**	**Positive social and ecological impact**
▪ Ministry of Water; Ministry of Energy; Ministry of Finance; Ministry of Land, Natural Resources and Environmental protection; Ministry of Agriculture (WARMA) ▪ Zambezi River Authority ▪ Energy Regulation Board, ZESCO + REA (Rural Electrification Authority) ▪ Meteorological department ▪ National policies (agriculture, irrigation, environmental) e.g. National Agriculture Investment Plan (NAIP) and National Adaptation Plan of Action (NAPA), Climate Change Adaptation Programme ▪ Farm-block Development ▪ Finance Institutions e.g. ZANACO, NATSAVE, Development Bank of Zambia ▪ Natural Resources Development College ▪ UNZA School of Agriculture and other agricultural colleges and universities ▪ Co-operating partners: World bank, AfDB, DFID, GIZ/KFW, UNDP ▪ Private Sector → irrigation dealers and supplier (+maintenance)	▪ Enhanced implementation of irrigation policy and other related policies ▪ Effective tax base and incentives for investments in irrigation ▪ Accelerate and scale-up rural electrification and irrigation schemes ▪ Enhance construction of dams in rural areas	▪ Enhanced resilience and improved livelihoods ▪ Enhanced social cohesion and co-operation in communities The impacts above lead to risk of raising user right conflicts! ➔ Traditional leaders e.g. on user boards/ Co-opt leader ➔ Enhancement/capacity building of user boards (conflict resolutions) ➔ Tale Measures to prevent adverse effect on soil properties (chemical and physical)

Access to energy

Best case scenario: An increased number of households in rural areas have access to electricity, with solar, hydro, biogas, wind and geo-thermal resources strengthened as sources of electricity.		
Key forces	**Suitable strategic measures**	**Positive social and ecological impact**
▪ Ministry of Energy (Rural electrification, Hydro and biogas) ▪ Ministry of Agriculture and Livestock ▪ CEC ▪ NISIR ▪ NGOs active in the energy sector ▪ Private sector ▪ Nakambala: sugar, biogas	▪ Assure supply with electricity to areas surrounding the mines ▪ Scaling-up biofuel and biogas projects → Follow-up ▪ Strengthen research on renewables and more efficient energy use ▪ Establishment of solar stations ▪ Strengthen PPPs ▪ Enhance decentralized production in rural areas ▪ Increase promotion of solar systems to enhance demand (awareness rising, demonstration)	▪ Shift to use of renewable energy ▪ Reduced dependency on forests ▪ Positive health outcomes ▪ Increased productivity and diversification ▪ Increased local industries and jobs/incomes ▪ Advancement of knowledge and skills

Prices of Agricultural products

Best-case scenario: Cost reflective prices spur production and improvements in quality of agro-products. Increased bargaining power and diversity of crops and livestock allow farmers to realize better prices.		
Key forces	**Suitable strategic measures**	**Positive social and ecological impact**
▪ Ministry of Commerce, trade and industries (Department of cooperatives) ▪ Ministry of agriculture (Agri-business and marketing department) ▪ Ministry of finance (trade policies) ▪ NGO & civil society (training) ▪ Farmer organisations ▪ Zambia cooperative Federation (ZCF) ▪ Food reserve agency ▪ Agro processors	▪ Facilitate the reduction of the cost of production: reduce duty on agro-inputs, promote local production of agro-inputs ▪ Encourage import substitution ▪ Increase access to market information and enhance capacity of farmers and NGOs ▪ Promote consumption of local products ▪ Promote value addition by agro processing companies (cotton, pineapple, melons, oranges etc.) ▪ Promote livestock stocking and restocking ▪ Increasing storage capacity of perishable agricultural products	▪ There is increase disposable income in rural areas which will lead to acquisition of property and improve rural livelihood and standard of living ▪ Reduced overexploitation of natural resources ▪ Social risk: Social upheaval due to increased consumer prices of staple food products ▪ Ecological risks: More destruction of natural resources due to intensification and over use of chemical fertilizers and other agro chemicals

▪ Agricultural subsidy policy (FISP)	/ warehouse systems ▪ Strengthen cooperative movement in rural areas (capacity building)	

Access to agricultural inputs

Best-case scenario: Affordable, easily accessible and timely supply of agro-inputs.		
Key forces	**Suitable strategic measures**	**Positive social and ecological impact**
▪ Ministry of Agriculture, NCZ; FISP, ZARI ▪ Private sector e.g. seed Co. & agro-dealers ▪ NGOS e.g. COMACO ▪ Seed certification institute (SCI) ▪ Seed growers ▪ Ministry of Community Development	▪ Strengthen research and development (R&D) for e.g. seed varieties ▪ Promote dealership in agro-business ▪ Strengthen regulation in the area of seed certification e.g. by seed certification institute ▪ Increase production of agro-inputs e.g. seed, fertilizers locally and at national level ▪ Creation of infrastructure in rural areas e.g. road networks, storage facilities, irrigation ▪ Improved targeting of FISP & FSP beneficiaries ▪ Tax exemption on agro-inputs e.g. vaccines, drugs	▪ Improved production and productivity ▪ Improved livelihoods of rural people

Access to financial services

Best-case scenario: The availability, affordability and reliability of financial services are improved in rural areas of Zambia (Changes depend on national interest rate).		
Key forces	**Suitable strategic measures**	**Positive social and ecological impact**
▪ MFI ▪ Bank of Zambia (regulatory board) ▪ Insurance Companies ▪ NGOs ▪ Corporate Banks e.g. NAT SAVE ▪ CEEC ▪ Youth Empowerment Fund ▪ FSDP financial sector programme ▪ Women Bank	▪ Reduce administrative costs for borrowers ▪ Strengthening regulatory capacities of BOZ+PIA regarding interest rates ▪ Policies that give incentives to Banks to extend into remote areas ▪ Strengthen collective collateral ▪ Innovative financial products especially for smallholders ▪ Policies that enhance effectiveness and efficiency of admin. Institutions. Money is there in funds but it needs better admin ▪ Improve business development	▪ Dependency on environment will be lessened. Precondition: natural resources will be used more sustainably ▪ Livelihoods of rural communities will be improved as bottlenecks are bridged ▪ Resilience to shocks is increased ▪ Women and youth are empowered (e.g. through Women Bank)

▪ Village Banking (is supported by different institutions) ▪ SACCOS ▪ Remittances (transfer well resolved by the market) ➔ private services ▪ e-voucher ▪ Rotational funds	advisory services ▪ Create politically independent institutions in charge of disbursement ▪ Apply environmental impact assessment in loan approval (procedures) ▪ Measures for improvement of financial literacy ▪ Policies to lower interest rates for eco-friendly activities ▪ Scaling up e-voucher	

Level of practical knowledge and skills

Best-case scenario: Levels of practical knowledge are increasing. Youth has access to training facilities and has increased awareness of skills that can lead to self-employment. Productivity of smallholder farmers and management of natural resources is increased due to higher levels of practical knowledge.

Key forces	Suitable strategic measures	Positive social and ecological impact
▪ Ministry of Lands and cooperating partner e.g. NISIR, National heritage, Ministry of education, Ministry of Health ▪ School programmes, Research institutions, ZARI, Universities seed companies ▪ Agricultural extension service providers ▪ NGOs and civil society (Worldvision, Self-help Africa, SNV, PRAZ, DMMU) ▪ Cooperating partners (EU, IFAD, FAO, ILO….) ▪ FISP, CFU, Climate smart agriculture (Ministry + FAO + UNDP) ▪ Famers organizations (ZNFU, ZCF, NUSFAZ, FOSUP) ▪ Traditional leadership ▪ Farmers clubs (MoA) ▪ Care-giving programmes ▪ Traditional midwifery	▪ Coordinated and harmonized extension approaches and content. Promote PPP in extension provision ▪ Promote and strengthen participatory approaches ▪ Strengthen knowledge sharing among farmers (farmer field schools, farmer exchange visits, farmer to farmer extension, agricultural commodity fairs) ▪ Reintroduction of production unit in schools and farmers clubs ▪ Technology transfer programmes (solar driven, coal briquette, timber, charcoal efficiency) ▪ Sensitization programmes ▪ Strengthening and training bylaws ▪ Strengthen village participation in management of natural resources through training ▪ Increase the number of health personnel in rural communities health centres ▪ Train communities in primary health care and nutrition	▪ Improved livelihoods of farmers and better use of natural resources (contributes to sustainability) ▪ Increased smallholder productivity ▪ Availability of natural resources is increased and wellbeing of communities is improved. ▪ Ecosystem based services are improved

Youth empowerment

Best-case scenario: The youth is increasingly empowered to participate in sustainable economic (agriculture, artisanal, trading) and social (cash transfer/access to finance, access to land, health) decision-making and activities.		
Key forces	**Suitable strategic measures**	**Positive social and ecological impact**
▪ Ministry of Youth; Ministry of science, technology and vocal training ▪ CEEC ▪ NGOs / CSOs, including churches ▪ Media and technology (ICT) ▪ Extension Services ▪ Skill centres	▪ Strengthen youth empowerment ▪ Policy in terms of men and women in the specified economic and social decision-making and activities ▪ Decentralise the disbursement of the youth empowerment fund ▪ Strengthen partnership between government, donors and other stakeholders and NGOs / CSOs and churches on planning and implementation of inclusive programmes, projects and activities ▪ Increase the number of programmes on youth empowerment throughout the country ▪ Tailor extension services to the youth ▪ Recapitalise and accelerate the establishment of youth skills centres in the country	▪ Retained youth in rural areas ▪ Increased participation of youth in the rural economy ▪ Increased and more informed decision making of youth in local governance ▪ Improved sustainable livelihoods in rural communities

Sustainability of Natural Resource Management

Best-case scenario: Improved watershed management.		
Key forces	**Suitable strategic measures**	**Positive social and ecological impact**
▪ Ministry of Water and Energy; Ministry of Agriculture ▪ Water rights authority (WARMA) ▪ ZEMA ▪ Private sector, mines, (e.g. Nakambala, drilling companies) ▪ Communities ▪ Water utility companies (e.g. under NWASCO) ▪ Natural heritage and conservation commission	▪ Improved forestry and watershed management ▪ Regulation of water abstraction or utilization (e.g. for irrigation, dams) ▪ Strengthening support i.e. the role of the water rights agency/authority	▪ Increased access to water by communities ▪ Improved access to water e.g. wildlife ▪ Improved agro-production & productivity including e.g. fish farming
Best-case scenario: Increasing fish production.		
▪ Ministry of Livestock and Fisheries ▪ Private sector companies e.g. lake harvest	▪ Strengthen law enforcement during fish bans ▪ Fish restocking	▪ Nutrition of people is improved ▪ Incomes are improved ▪ Biodiversity

▪ NGOs e.g. Peacecorps, worldfish int. ▪ Communities	programmes ▪ Promotion of sustainable fishing methods and fish farming	conservation improved
Best-case scenario: Reduce deforestation and increase afforestation.		
▪ Ministry of Land, Natural Resources and Environmental Protection; Ministry of Agriculture; Ministry of Energy; Ministry of Finance (climate change secretariat); Ministry of Local Government and Housing; Ministry of Mines ▪ ZEMA + RDA ▪ Cooperating partners (WB, UNDP, ILO) ▪ NGOs promoting agro-forestry e.g. COMACO, CFU ▪ CBOs & communities including traditional leaders ▪ Private sector (e.g. timber companies)	▪ Allocate more funding to afforestation and reforestation programmes ▪ Forestry extension services ▪ Creation of ownership in the communities ▪ Creation of individual and community woodlots ▪ Promotion of agro-forestry ▪ Promotion of alternative sources of energy and improved cooking stoves ▪ Effective law enforcement as regards forestry: kind, mining etc. ▪ Promotion of NTFP: usage as a strategy for reduced deforestation	▪ Livelihoods improved by using NTFP (for own consumption and for income generation) ▪ Reduced soil erosion, watersheds are improved, biodiversity is conserved
Best-case scenario: Land and soil fertility is improved.		
▪ MAL, ZARI, Extension service; Ministry of Land and environmental protection; ZEMA ▪ NGOs e.g. CFU ▪ Universities and research centres and colleges ▪ Private sector companies, e.g. COMACO ▪ Programmes like SNDP, NAIP, FISP ▪ Traditional leaders and communities ▪ Ecosystem based adaptation for food security	▪ Reduce extension officer/farmer ratio, provide enough resources for effective extension e.g. transport ▪ Encourage diversified production under FISP ▪ Promotion of agro-forestry ▪ Promotion of organic fertilizer e.g. compost manure ▪ Allocation of more funds to universities, colleges and research centres ▪ Effective implementation of already existing programmes ▪ Improved governance e.g. FISP, FRA, ZEMA	▪ Improvement in production and productivity for all livelihoods ▪ Improved land use and soil fertility

Best-case scenario: Improved wildlife, protected areas.		
▪ ZAWA ▪ Ministry of Tourism and Arts ▪ Tour operators ▪ NGOs, CBOs e.g. COMACO	▪ Widening alternative business opportunities for around national parks/game reserves ▪ Promotion of tourism and benefit sharing with communities ▪ Enhance monitoring of touristic industry	▪ Improved livelihoods ▪ Inclusivity of local communities ▪ Wildlife/game and biodiversity is conserved

Smallholder Productivity

Best-case scenario: Smallholders' productivity in terms of yield per unit area/input has increased significantly above the current levels; Smallholder farmers adopt improved technologies (i.e. us of improved seed varieties) and farm practices such as conservation farming, timely planting and weeding, proper use of fertilizers.		
Key forces	**Suitable strategic measures**	**Positive social and ecological impact**
▪ Ministry of Agriculture ▪ NCZ ▪ Research institutions ▪ Training institutions e.g. KATC ▪ Bureau of standards ▪ Farmers organisations, unions ▪ Private sector (companies) ▪ NGOs/CSOs including churches, CFU	▪ Revive training facilities in districts/rural areas ▪ Encourage PPP for better outreach ▪ Strengthen coordination of agric. Extension services ▪ Create options for organic fertilizers ▪ Lobby funding for research and training institutions ▪ Regulate quality of agro-inputs for rural areas ▪ Strengthen the farmer field school approach ▪ Institutional support to farmers organisations ▪ Coordinate how private companies carry out their business in rural areas ▪ Strengthen advocacy work and awareness creation	▪ Improved smallholder livelihoods ▪ Enhanced knowledge and skills ▪ Increased soil fertility

Annex

1.1 Discussion influence matrix

Factor A: Access to water (productive) and its influence on

Factors	Strength	Influence
B-Access to Energy	1	Water for productive purposes entails water for electricity generation through hydropower production. At community level, mainly commercial and some medium-scale farmers use energy for irrigation. Influence is moderate because it only concerns electricity and not all forms of energy. Also, only a small part of the population is using energy.
C-Prices of agricultural products	2	Water influences production quantity. Most of the agriculture is rain fed. If we don't have enough rain it has an impact of the supply and therefore national prices will shoot up. Example: the price of maize during the dry season is three times higher compared to during the rainy season.
D-Access to agricultural inputs	0	No
E-Access to financial services	0	No. even if you have a reliable irrigation system, access to credits would not necessarily be better. It depends more on yield and credit worthiness
F-Practical knowledge and skills	0	No
G-Health Status	0	No, nutrition is too indirect
H-Youth Empowerment	1	Rural youth need water to get into crop production and fish farming. If there is no water, it will restrict the opportunities of the youth. The majority of the activities in rural areas depend on agriculture and therefore it has an effect on the opportunities entailed. Water is not available everywhere and only in some areas.
I-Sustainability of natural resources	2	Water is life. Whether it is forest or whatever resource, water is very important in the natural resource arena. If you don't have water, you don't have trees, fishes. Access to water also has an effect on the stock of fishes. A reliable source of water will result in more efficient use of the resource. With time you will know how to effectively manage your irrigation scheme. Directly affects the management, also if thought on a larger scale: when more and more industries get access to water, this also affects natural resources, e.g. in the case of pollution.
K-Smallholder productivity	2	Production of small-scale farmers is highly dependent on rain. If they do not access the rainwater (e.g. because of droughts), they will suffer. In the framework of climate change they are very vulnerable. Therefore, if they have access to running water streams, in the long time they will be able to increase their productivity or go into production of crops that consume more water like vegetables or even into the production of livestock.

Factor B: Access to energy and its influence

Factors	Strength	Influence
A- Access to Water	1	Energy is necessary to run pumps or obstruct water from local streams. You also need energy to dig wells. Some farmers operate small pumps to irrigate their gardens.
C- Prices of agricultural products	2	If we assume a level of motorization and we assume that tractors will use diesel or bio fuels. In all our development plans we want farmers to use machinery in the future. This has an impact on cost of production. We hear the story amongst our medium to large-scale farmers that if there is a fuel crisis, it impacts the prices. This also includes the transportation cost which will reflect in the prices. The energy component in Zambia is one of the biggest production costs. Our fuel is the most expensive in the region. If you have access to efficient access to energy, you will produce at larger scale and you will use economies of scale. But this concerns only a certain type of farmer. Small-scale farmers mainly use charcoal and solar energy as sources.
D-Access to agricultural inputs	2	This highly reflects in the transport component which contributes to the costs of inputs. If agro dealers are to deliver bags of fertilizer and so on. The energy cost is reflected in the price.
E-Access to financial services	1	Only if there is access to energy, financial facilities can work in rural areas. Without access to energy, a lot of transactions aren't possible. For example mobile banking activities. If you cannot transfer money from your account to another account this will diminish the financial service. Introduction of electronic vouchers: they give vouchers to selected farmers that then have to travel to town. FRA requires every farmer to have a bank account to be paid. But not too many farmers are involved in government buying schemes. There are also middlemen and many farmers sell to these traders. Moderate influence
F-Practical knowledge and skills	1	Yes there is a linkage (easier to acquire skills with energy). For technical training you might need energy, like e.g. carpentry.
G-Health Status	2	Strong, because medical facilities do not work properly without energy. This involves the cooling and provision of drugs or operation of equipment (e.g. used in surgeries or incubators for new-borns).
H-Youth Empowerment	1	Simple tools powered by electricity can be used. The link mostly refers to artisanal employment opportunities.
I-Sustainability of natural resources	2	Today, people rely on charcoal, if they had access to energy, there wouldn't be so much deforestation
K-Smallholder productivity	2	Energy will allow farmers to also produce during the offseason. In some industries you need electricity, like for poultry, processing, value addition etc.

Factor C: Prices of agricultural products and its influence

Comment: Factor was combined with the income sphere in a second round, because a strong relation was seen between prices and income (if this would be denied, than the factor is highly influenceable (high passive sum) and does not have any influence on other factors (low active sum) which does not reflect the reality.

Factors	Strength	Influence
A- Access to Water	1	Relation is very direct as with income access to irrigation increases: moderate. With enough resources, the farmer can buy the necessary equipment to irrigate the field.
B-Access to Energy	1	Similar to A. With a higher income you are more likely to get access to energy.
D-Access to agricultural inputs	2	Similar to A and B. Influence will be stronger, as access here is clearly affordability
E-Access to financial services	1	With higher income, demand for financial services rises, but the bank is interested in consistent cash flows: with agriculture, income is a seasonal business. With higher income, you increase your financial security and improve your credibility. Some of the finance institutes ask for collateral including down-payments.
F-Practical knowledge and skills	0	Relation is too indirect; prices can motivate but don't directly change. We assume that with more money you get education but this is not necessarily the case.
G-Health Status	1	When prices are higher, it has an impact on the affordability of quality food and thus health status. ☺ Higher prices have a direct impact on your mental wellbeing, On the other terms you can be shocked when the price is too low.
H-Youth Empowerment	1	Similar to health status, money doesn't necessarily empower the youth. Higher prices set incentives to engage in certain activities and looking as farming as a business. The youth will become entrepreneurial. Higher prices will definitely impact the decision-making of young farmers, e.g. honey production has a good market value. Many NGOs and Ministry of Agriculture encourage and empower the youth to go into honey production.
I-Sustainability of natural resources	2	If you have high prices for a crop, then the farmers go into mono-cropping. This influences the soil fertility. Here also the practices play a role. If prices are high and attractive, farmers will invest in it. More income can trigger agricultural diversity, intercropping etc. Whenever there is an increased price, then there will be a reaction and distortion in the natural resource. This is what we see with the demand for game etc. Another example is "black maize": people go for charcoal production as this gives them more money than maize production.
K-Smallholder productivity	1	Farmers in Zambia first try to expand their area, not intensify their production. Production would be a strong link, but productivity consists of many different factors.

Factor D: Access to agricultural inputs and its influence

Factors	Strength	Influence?
A-Access to Water	0	no
B-Access to Energy	0	no
C-Prices of agricultural products	2	If you have inputs you can yield higher prices respectively if prices of inputs are very high or inputs are hard to find, this will reflect in prices
E-Access to financial services	0	no
F-Practical knowledge and skills	2	NWK provides inputs together with knowledge. FISP provide inputs to those that are trained in conservation agriculture. In fish farming, the government provides inputs together with training of how to manage the types of fishes. If it is connected to out-grower schemes, agriculture inputs have to be connected to knowledge. Even without conditionality you as a farmer have to know how to use the inputs. There is knowledge attached to application. This influence is strong but only affects one small part of knowledge and skills.
G-Health Status	1	Is access to chemicals automatically leading to the use of it? Because that impacts health negatively. On the other hand, you could also get some protection gear. In some areas, people have died because they drink the cotton pesticides. Access to protection gear is not part of the agricultural inputs. As soon as there is handling of chemicals involved, there is risk.
H-Youth Empowerment	2	Access will increase opportunities.
I-Sustainability of natural resources	2	In areas where they practice slash and burn. If there is access to inputs, there will be a decrease in the deforestation rate and cutting of trees. There is also a reverse effect. We have started using fertilizer and that has also an environmental impact.
K-Smallholder productivity	2	IAPRI reports on FISP shows that it contributed to productivity gains. The raise in maize productivity has increased because of fertilizer and improved seeds.

Factor E: Access to financial services and its influence

Factors	Strength	Influence
A- Access to Water	2	If you get a loan, you buy access to irrigation (irrigation equipment)
B- Access to Energy	2	People invest credits in energy access (solar panels)
C- Prices of agricultural products	0	Does not directly affect prices
D- Access to agricultural inputs	2	Credits for productive assets, e-vouchers…
F- Practical knowledge and skills	1	Banks won't get into literacy programmes. Bank services are linked to training and the provision of knowledge – so there is knowledge transfer because of the accessibility of financial services. This is in the range of business development service provision. There are banks that gave out loans and lost the money. Now the loans are closely linked to the planning. There are "vision loans" and the youth empowerment fund. Farmers do receive training together with loans. This is however very limited in scale.
G- Health Status	1	Health insurance would increase the health status BUT: This is a scenario for industrialized countries or urban areas, NOT in rural areas. It could allow you to purchase some protective gear, you are increasing to some extent your resilience (security), you can purchase medicine and nutritional food, Loans used for medical emergencies (you may become a defaulter for repayment)
H- Youth Empowerment	2	Increases/open ups opportunities. Start-up loans to start businesses. Promoted especially through the youth empowerment plan
I- Sustainability of natural resources	2	Will minimize unsustainable practices. Finances will help me to manage my resources more sustainably: e.g. purchase of fertilizer to maintain soil fertility instead of slash and burn practices, purchase cattle and get manure (instead of artificial fertilizer), invest I other crops and diversify which will reduce mono-cropping
K- Smallholder productivity	2	Allows for intensification. In out grower schemes companies have provided financial resources: Cotton, tobacco, fisheries, livestock: diversification and better inputs

Factor F: Practical knowledge and skills and its influence

Factors	Strength	Influence?
A- Access to Water	2	Capacities to understand potential of water access (if knowledge is the limiting factor: e.g. farrow irrigation, (but we talk of affordability, reliability): Better irrigation system helps for reliability: if you use certain irrigation system access to water becomes more reliable than with another technology. Knowledge itself may not improve the access to water (only indirect). Through knowledge, people construct embankment of stream: retains water and brings it closer: increases availability and options. With JICA: people have water but they don't use it: with simple training, water can be directed and accessed. Water management training: identify water sources, plant trees (water retention), build treadle pumps (also in NW province with peace corps)
B- Access to Energy	1	Similar argument: solar energy, diversity of energy sources: increased awareness is not sufficient, it needs practical knowledge. The signs are showing that even domestic waste can be used as a source of energy. I found light around some houses and I could not know where the light was coming from. They were using domestic waste as source of energy: (biogas from old latrine for knowledge). Plan to use crop waste for local commercial centres.
C- Prices of agricultural products	1	Negotiation skills (currently low). Negotiation based on knowledge to "do your costing". Knowing your costs will allow you to better negotiate. Also you need knowledge on price for quality. This protects from manipulation. E-SMS service system on buyers and prices installed by ZNFU → increases market power of sellers. Only moderate influence.
D- Access to agricultural inputs	1	If you know which shop sells which sort of merchandise and where to get, which are valuable and for what purpose, how to use them" Seed scenario: germination percentage here is not given or not the crucial factor: prices are decisive for the purchaser, not necessarily the quality. Government is main supplier. This means that the inputs come to you, regardless of the knowledge you have. market is limited, the majority goes for what is available In other situations for specialized farmers, they will utilize their knowledge but under Zambian circumstance it is moderate
E- Access to financial services	2	Knowledge to write business plan, marketing strategies, productivity projection: facilitates access. It sets the rationale for the FI to provide loan
G- Health Status	2	Very influential: on dangers of HIV, application of dangerous substances, health behaviour.
H- Youth Empowerment	2	
I- Sustainability of natural resources	2	Very strong: conservation farming and positive effects on soil; Use of fertilizers; Good management practices
K- Smallholder productivity	2	Knowledge on improved management practices is relevant but it needs to be applied

Factor G: Health status and its influence

Factors	Strength	Influence?
A- Access to Water	1	If people are sick or disabled you cannot really carry buckets or apply pumps. You are not as mobile and active. Physical access to boreholes, water holes requires physical health. There are also many studies that show an impact of HIV Aids and productivity. If you have a social network that helps you, the impact might be less. But if you do not have a social network it will be bigger. Your health status does have effect on your physical access to water as it determines the energy you have to fetch water, to do irrigation
B- Access to Energy	1	Same as water: access to charcoal
C- Prices of agricultural products	0	
D- Access to agricultural inputs	1	Need to travel to obtain inputs. Requires physical effort
E- Access to financial services	1	Need support because of physical disadvantages. Social exclusion of disabled persons. There will be more challenge to open an account as a disabled person
F- Practical knowledge and skills	2	When in good health I am able to learn. When you are fine you can put your skills into effect. Issues of nutrition come in, make your assimilation skills higher
H- Youth Empowerment	2	More likely to be vulnerable. High HIV risk group. NGOs paying particular attention to health → youth empowerment Early child marriage also has an impact on production levels. There will be less labour available on the farms.
I- Sustainability of natural resources	1	Organic farming, conservation practices often more labour intensive (e.g. digging of basins, very physical). The stronger and healthier farmers are, they can engage in more diversified activities like for example cutting trees. There are certain communities that spend much effort to identify medicinal value of natural resources and they have planted and conserved area for this. Future generation has to be healthy, therefore very relevant (2); stewardship is reliant on the steward. If steward is not healthy, he/she cannot manage resources sustainably (but: he/she could not manage resources at all, neither sustainably or unsustainably) – stewardship is a communal task, not just an individual one, and the health status is a more individual issue. Health status must not be underestimated. Medical value of certain plants to cure diseases → favours conservation.
K- Smallholder productivity	2	

Factor H: Youth empowerment and its influence

Factors	Strength	Influence
A- Access to Water	1	Empowered entrepreneurial youth will thrive to use water for agricultural activities. Not every youth wants to engage in agriculture (even in rural areas). Irrigation, fish farming. How many youth will be empowered?, agriculture is not "sexy", working land is too cumbersome – but if we go beyond production into processing and value adding, it might become more attractive
B- Access to Energy	1	Similar to water (increased demand), but they may concentrate more on artisanal activities. More opportunities → increased need of energy for certain enterprises to which youth has been empowered. Increased demand: people try to make up for opportunities bygone. Higher empowerment (knowledge and business opportunities) has an influence on energy demand, and through that can indirectly influence access (availability, reliability) but only if energy suppliers are responsive. The questions of access and affordability are not directly affected by empowerment.
C- Prices of agricultural products	0	There is an influence but it's considered marginal or indirect (if production increases tremendously).
D- Access to agricultural inputs	2	Skilled people will demand inputs: market will follow. Youth may also go into business and become input dealers and thus increase availability of inputs in local setting. Many enterprises of empowered youth → pulls input suppliers. BUT: youth empowerment does not have a huge coverage
E- Access to financial services	2	Banks are strict now: if you can prove knowledge and skills (empowerment) you have access to financial service. Also students credits.
F- Practical knowledge and skills	2	If you are empowered you get more knowledge (circular relationship, mutually reinforcing)
G- Health status	2	More engaging in business activities less time for silly things (STI…). But contrary statistics: empowerment more active and potent youth – risk of transmission: you might have more money and opportunities to engage in risk behaviour. If I am carpenter with know-how I can use machinery better, less risk of accidents. More responsible and socially aware you would act more responsibly: get tested for HIV/STI. Theoretically, youth empowerment can lead to higher income; you can better look after your health and take preventive measures (nutrition…).
I- Sustainability of natural resources	2	If empowered I can take more responsible positions, I can opt for more diverse economic activities and would thus contribute to more sustainable resource use (less dependency on direct exploitation of natural resources). Or they can engage in unsustainable activities (trucks transporting resources). An organization provided alternative livelihoods for youth that were involved in poaching Young ivory poachers receiving training in pottery, carpentry – decreased pressure on species. Exacerbated by the magnitude of young generation
K- Smallholder productivity	1	With know-how on various agricultural activities the productivity should increase – knowledge and skills aspect concerning good agricultural production. But: so many factors affecting productivity, knowledge alone is not sufficient

Factor I: Sustainability of natural resources and its influence

Factors	Strength	Influence
A- Access to Water	2	Deforestation: When we talk about deforestation as one driver of climate change which might result in good/bad rainfall: People have droughts and now people are not able to access water. Protection of forests will retain and regulate water flows: Protected national forests ensure perennial river flows throughout the year.
B- Access to Energy	2	The majority of people are using wood fuel. So the way in which you manage your resources (replanting) does have an effect on access to energy. When we have enough water bodies this means that even Hydropower stations will be able to provide energy. So: Power production depends on the natural resources management.
C- Prices of agricultural products	1	If you don't manage your soil, if you don't manage water, production will go down. Your supply for agriculture commodities will be low and then this will affect prices. This might be very indirect. Organic products don't get better prices (only niche markets or for abroad). Only if farmers comply with standards they can get higher prices but the link is weak: example COMACO: if farmers adhere to conservation agriculture, or to organic production and processing, they get a better price for organic grown but on the average this is not the case. Some companies only want products produced in a certain manner (honey): Honey hunters are being excluded by large scale purchasers (because they use destructive methods and produce contaminated/uncontrolled products), therefore they try to sell to lower price). Labelled food receives good prices ("forest food") as it stands for good quality. There is in some cases, a limited link.
D- Access to agricultural inputs	1	For some inputs there is a link, mainly in outgrower schemes. Even COMACO does not provide inputs. Indigenous seed banks increases availability (distributed through associations) – not so well represented, community seed banks have widely failed. Production of organic fertilizer by friends of forest society (sustainability aspect), BUT: almost negligible. Other aspect: organic manure, less requirements for inputs due to conservation farming as it is being promoted (ploughing residues from growth
E- Access to financial services	0	Only if conservation agriculture is a conditionality (promoted by NGOs – project linked), but at a very limited scale But: in the future, influence could grow (via SDG measures, finances could be channelled towards sustainability)
F- Practical knowledge and skills	1	whatever you do: adaptive management, learning by doing, you drop inefficient practices and adopt successful solution and practices
G- Health status	2	Poor management usually results in depletion of natural resources which are very necessary for your health. There is an increase in global warming and we have complications (lack of fresh air detrimental to health, skin issues due to lack of piped water. Air pollution (urban areas), etc.). Failure to manage mining properly: Mining results in land poisoning. This has terrible effect on the health status (lead, other heavy metals. Urban areas → air pollution
H- Youth Empowerment	2	IF you don't manage the NR today, how will the youth be empowered? Unsustainable management reduces the opportunities of youth and coming generations (water, land): e.g. pollution from mines reduces opportunities (agriculture); deforestation reduces their opportunities to choose. Most of the production is done using natural resources. Land is the most productive resource, cattle rearing, fishing… all these issues are impacted by unsustainable management. Because of bad fishing methods (mosquito

		nets extracted even the fingerlings) in the past no fishing opportunities for the youth. The promotion of aquaculture for youth is important. But opportunities do not only depend on sustainability. People depend directly on natural resources (80%). Depletion might open up new opportunities (production of manure, reforestation). Research in southern province on youth empowerment: lots of youth involved in charcoal production; forest depletion, many had no more income and had to drop out of school → disempowerment (intervention options: reforestation, better management of the own activity, stove construction…). Kariba damn and pollution has restricted agriculture production. This results in fewer opportunities for the youth; youth cannot succeed if there is no vegetation and natural resources.
K- Smallholder productivity	2	

Factor K: Smallholder productivity and its influence

Factors	Strength	Influence
A- Access to Water	0	Only indirectly via income increase
B- Access to Energy	0	Same as water
C- Prices of agricultural products	0	More efficient production, you reduce the cost of production → inefficient production is reflected in the price in order to reap a profit margin. BUT: Prices are a result of demand and supply, not by the productivity of the individual farmer. Productivity only affects prices if it has first affected production.
D- Access to agricultural inputs	0	If productivity increases the production and thus the income, than the access to inputs would be increased (indirect)
E- Access to financial services	1	If you can prove certain productivity levels you will be granted credits (banks argue while they prefer commercial farmers – because of their productivity level).
F- Practical knowledge and skills	0	Increased productivity increases your curiosity to learn more (or is it the other way round?). Lead farmers (most productive, most successful are used to train other farmers. BUT: they are more productive because they are more knowledgeable (plus other assets), so relationship is the other way round. If you make mistakes you want to acquire more knowledge. COMACO is providing practical skills for conservation farming. It is up to a farmer to take up the skills once they see that other farmers are more productive.
G- Health status	0	
H- Youth Empowerment	1	Maybe through employment effects: if you have a lot of produce you might need to employ youth for marketing and selling. High productivity (from certain crops) can provide attraction to youth.
I- Sustainability of natural resources	2	Conservation farming (compost manure, zero tillage) – will continue sustainable practices if the productivity is good. If you apply optimum levels of inputs (increased productivity) or if you use high inputs for higher productivity (green revolution) you'll have impact on natural resources and sustainability (either way).

1.2 List of participants

No	Name, First Name	Organization
1	Banda, Daisy	Japan Tobacco International
2	Banda, Diana	University of Zambia, Dept. of Agric. Economics
3	Banda, Joseph	Ministry of Labor and Social Security
4	Daka, Daniel	Central Statistical Office
5	Kaili, Mutale	Civil Society for Poverty Reduction (CSPR)
6	Kalinda, Dr. Thomson	University of Zambia, Dept. of Agric. Economics
7	Kasaro, Deuteronomy	Ministry of Finance Climate Change Secretariat
8	Kayula, Frank	National Union for Small Scale Farmers (NUSFAZ)
9	Maxson, Nghoma	Civil Society for Poverty Reduction Zambia (CSPR)
10	Mayondi, Chilayi	Mulungushi University Centre for Labor Studies
11	Mooto, Nakubiana	Ministry of Labor and Social Security
12	Mulenga J. Bwalya	AgDevCo
13	Mvula, Christopher	Zambia Development Agency
14	Mwanza, Joseph	NWK Agri-Services
15	Mwenge, Felix	Zambia Institute for Policy Analysis & Research
16	Mwila, Godrey	Zambia Agriculture Research Institute
17	Nyirenda, Gertrude	Community Markets for Conservation (COMACO)
18	Reynolds, Shula	Ministry for Agriculture and Livestock (MAL)
19	Sakala, Absalom	Min. of Lands, Nat. Resources and Environmental Protection
20	Siampale, Abel	Min. of Lands, Natural Resources and Env. Protection
21	Sibbuku, Eben	Zambia Development Agency
22	Silwimba, Chazya	Min. of Lands, Nat. Resources And Environmental Protection
23	Simpuki, Brave	Zambeef
24	Zulu, Thokozile	Wildlife and Environmental Conservation Society of Zambia (WECSZ)

1.3 Workshop programme

Workshop Title: Building Scenarios of Rural Transformation in Zambia		
Participants	Representatives from the Government of Zambia and from Research Institutes, Private Sector Companies and Non-Governmental Organisations working in Zambia	
Time	Monday, October 19, to Friday, October 23, 2015	
Facilitator	Christian Berg, comit GmbH Berlin Co-Facilitation by Erik Engel, SLE/Humboldt-Universität zu Berlin	
Objectives	The participants have built scenarios of rural transformation in Zambia until the year 2030 and developed strategic recommendations on how to work towards a socially inclusive and ecologically sustainable rural transformation	
Sessions	Registration 8:30 Morning session I 9:00 – 10:30 Morning session II 10:45 – 12:30	Afternoon session I 13:30 – 15:00 Afternoon session II 15:15 – 17:00

Programme of activities:

Day 1: Monday, 19 October
▪ **Registration** ▪ **Welcome address by German Embassy, Lusaka** ▪ **Introduction to the Workshop, participants, research background and topic** ▪ **Identifying and weighting of factors relevant to rural transformation in Zambia**
Day 2: Tuesday, 20 October
▪ **Describing alternative developments in factors relevant to rural transformation in Zambia** ▪ **Developing a business-as-usual, best-case and worse-case scenario for rural transformation in Zambia**
Day 3: Wednesday, 21 October
▪ **Analysing the mutual influences of factors that determine rural transformation in Zambia** ▪ **Reviewing factors in a systems approach**
Day 4: Thursday, 22 October
▪ **Analysing passive and active scores of factors to determine their power** ▪ **Developing strategies and recommendations for a more inclusive and sustainable rural transformation**
Day 5: Friday, 23 October
▪ **Developing strategies and recommendations for a more inclusive and sustainable rural transformation** ▪ **Reviewing scenarios, outlook and follow-up to the workshop**