

Macademia Sub sector assessment – Nepal



Source: HELVETAS Swiss Intercooperation Nepal

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Step 1: Map core functions, support functions and roles/regulations in the selected market system









Step 2: Identify current and future hazards, impacts and current coping strategies

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Hazard	Hazard	Specific hazard				Prioriti	zation	
Туре	Subtype				Facilit	Group 1	Group 2	Group 3
					ator			
	Meteorological	Changing	Increase/Decrease			1	1	1
	J	temperature	Diurnal variation			1	1	1
			Seasonal variation			1	1	-
		Changing	Increase/Decrease			1	-	1
		precipitation	Seasonal heavy rainfall			2	1	1-2
			Timing			1	1	1
		Changing	Increase/Decrease			-	-	-
		numicity	Transiant starm					
		Storm	Frequencial storm			-	-	-
			Extra-tropical storm	Dorocho		-	-	-
			Convective storm	Derecho		-	-	-
				Hall		3	2 1	2
				thunderstor		1	1	-
				m				
				Rain		2	1	1-2
				Tornado		-	-	-
				Sand/ dust storm		-	-	-
ral				Winter storm/blizza		1	-	-
latu				rd				
2				Storm/surg		2-3	-	-
				e				
				Wind		2-3	1	2
		Extreme Temperature	Cold wave				-	
			Heat Wave				-	
			Severe winter conditions	Snow/ice		-	-	-
				Frost/freeze		1 (for coffee)	-	Less
		Fog	Fog				_	-
	Hydrological	Flood	Coastal flood			_	_	_
	.,		Riverine flood			-	_	-
			Flash flood			-	-	-
			Ice jam flood			-	_	-
		Landslide	Avalanche (snow, debris, mu	dflow, rock		1	-	1
			fall)					
		Wave action	Rogue wave			-	-	-
			Seiche			-	-	-
	Climatological	Drought	Drought			1	1	2
		Glacial Lake outbu	ırst				-	-
		Wildfire	Forest fires			-	-	-

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Hazard	Hazard	Specific hazard			Prioriti	zation	
Туре	Subtype			Facilit	Group 1	Group 2	Group 3
				ator			
			Land fire: Brush, bush, pasture		-	-	-
	Biological	Epidemic	Viral diseases			-	-
			Bacterial diseases			-	-
			Parasitic diseases			-	-
			Fungal diseases		1	3	1
			Prion diseases		-	-	-
		Insect infestation	Locust/Grasshopper/Other insects		1	-	1
		Animal	rat		3	1	2
		accident					

Source: HELVETAS Swiss Intercooperation based on disaster classification adapted from http://www.emdat.be/guidelines

Explanation:

Prioritization: 0= not relevant; 1= lowest priority; 2= medium priority; 3= highest priority; C= current; p= potential

- **Group 1:** Macadamia farmers from Syanja discrict (more than 20 years)
- **Group 2:** Cooperative staff and board members, District Agriculture Development Office representatives Malepatean
- Group 3: Helvetas staff (Alok Shrestha, Soma Rana, Ananda Parajuli, Andrea Barrueto)



Table 2: Hazards, impacts and coping strategies

Hazards	Intensity ¹	Frequency ²	Observed Trends ³	Future Trends⁴ Possible Evolution under climate change	Impacts	Severity ⁵ (expressed in % and indicated which part of the market system is affected)	Current coping strategies	Is the strategy sustainable? If not why?
Animal attack: rat/squir rel	Very high	Daily during season	increasing	decrease in future due to the effects of climate change.	Eat nuts	20-60%, one farmer reports: out of 30 trees he harvests 40kg nuts	Rats: Cats Iron sheet around stem Traps Squirrels: nothing	 Cats do not chase all rats Rats still climb tree Tried out, not good trap (?)
Hail	Low – high Every 5 th year big size hail stones	yearly	50yrs ago heavier hail with bigger stones, size decreasing	Scientific studies suggest that there is a correlation between climate change, the frequency and severity of extreme weather events which can lead to more hailstorm activity and hence more damage	Impact on branches, fruits and flowers	Malepatan: litchi crop was lost 95%, macadam-mia 50%. Total 40%	None	-
Storm	Low-high, not every year high intensity	Yearly, mostly mid- March, April, mid-May	Storm is more intensive than before. However, lesser	Scientific studies suggest that there is a correlation between climate change and the frequency and severity of extreme weather events which can to more storms	Impact on branches, fruits and flowers	20%	None	-
Wind	Low-mid	Yearly, but not every year big impact	Wind	Globally, wind speeds are suggested to slow down and over the next 30 years they are expected to continue to do so (Damschen et al. 2008; Vautard et al. 2010).	Impact on branches, fruits and flowers	30%	Plantation is close to the house intercropped with other trees > wind shelter	Yes, little affected.
Fungal disease: rust	Medium (10-15 trees out of 300)	Appearance this year 2016	Only started to arrive.	pathogen of fungal diseases will be destroying due to the effect of climate change but may be outbreak of new pathogens and diseases.	Husk and leaves are affected. According to Malepatan, nut tastes differently.	Only a few farmers a few trees.	 In-house research on how to treat the rust (Government) 	Not yet.
Heavy rainfall	Low- medium	yearly	Late monsoon, heavier rain falls > new phenomenon	Climate change is predicted to lead to changes in precipitation.	Early fruit drop		None	-
Drought	medium	Once in 10 years	In the past 20 years	Predicted to become more regular	Dry out flowers if no irrigation is available. Fruit drop and slow plant development	Difficult to estimate	Give water	Needs to be improved



Source: modified by HELVETAS Swiss Intercooperation from CRiSTAL

Explanation:

¹Frequency: How often a hazard occurs (e.g. once or more a year, every 2-4 years, every 10 years, less frequent

²Intensity: How "strong" the hazard is when it occurs (e.g. low, medium, high, very high)

³Observed Trends: Do the community members observe a change? Is there a trend?

⁴Future trends: Is there a trend in observations? Since community members are most likely not aware of new and changing future trends, it is recommended that you gather this information from scientific sources.

⁵Severity can be determined considering the criteria like type of impact and degree of losses, % of district affected, damage of physical facilities, damage by geographical coverage, social impact due to disaster/hazards etc.



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Table 3: Hazard and crop seasonal calendar

Hazard	J	F	M	A	N	1 J	J	Α	S	0	N)
Local calendar	Р	М	F	С	В	J	Α	S	В	Α	κ	M	Ρ
Wind			х	х	х								
Storm				х	х								
Hail				х	x	x							
Drought				x	x	х							
Rust (when nuts starts to ripen)						х	х						
Heavy rain fall								x	x				
Rat/Squirrel					x	х	х	х	x				
Crop seasonal	J	F	Ν	A I	N	I J	J	A	S	0			D
calendar													
Local calendar	P	M	F	C	B	J	A	S	B	A	K	M	Ρ
Local calendar Flowering (earlier)	Р	M	F	C	В	J	A	S	B	A	K	M	P
Local calendarFlowering (earlier)Ripening of macadamia (earlier)	Ρ	M	F	C	В	J	A	S	B	Α	K	M	P
Local calendar Flowering (earlier) Ripening of macadamia (earlier)	Ρ	M	F	C	B	J	Α	S	B	Α	K	M	P
Local calendar Flowering (earlier) Ripening of macadamia (earlier) Flowering (now)	Ρ	M	F	C	B	J	A	S	B	Α	K	M	P
Calendar Local calendar Flowering (earlier) Ripening of macadamia (earlier) Flowering (now) Fruiting of macadamia (now)	P	M	F	C	B 	J 		S	B	A	K	M	P

Step 3: Identify each function's vulnerability to climate risks

Table 5: Determinate climate risk relevant functions

Climate risk relevant market functions (see Step 1)		Relevant climate risk (hazard) (see Step 2)	Remarks on impacts
Core	Seedling	Hail/wind/storm/erratic rain	Under the roof – not impacted
	Production	hail, storm, wind, fungal disease, heavy rainfall, drought	Reduced yield per plant. Damage on trees
	Packaging/stora ge	Hail/wind/storm/erratic rain	Inside the house, not impacted
	Market		_
Support	Agricultural research	Rust – fungal disease	Exchange with foreign experts about best practices and apply results in Nepal
	Technical provision	Rat	Finding ways to deal with the rat (and also squirrel in other districts)
	Technical provision	Wind	Pruning could help to develop strong branchesPlan wind hedges when layout the orchard
Rules/ Regulat ions	Policy development (decided production areas/ product zone		_

Source: modified by HELVETAS Swiss Intercooperation from the operational guide for the making markets work for the poor approach, 2014

Step 4: Identify most resilient sub-sectors based on a scoring matrix

Table 6: Scoring matrix

Catagory	Critoria	(Moighting)	Sub-	sector	Remarks	
Calegory	Griteria	(weighting)	Sub- sector A	Sub- sector B	Remarks	
Poverty	Number of households engaged in the sector					
Reduction Potential	Severity of poverty facing those engaged in the sector					
	Potential for participation of women in the sector					
	Potential for participation of youth in the sector					
	Possibility for the target group to improve income / access to jobs					
Economic Growth Potential	Previous growth trajectory (last 5 years)					
	Forecast for growth in the next 5-10 years					
	Import substitution potential					
	Export potential					
	Level of competitiveness					
Potential to facilitate	Level of consistency with public/national priorities, government interest					
systemic change	Private sector interest					
	Presence of potential lead firms					
	Availability of partners/champions with leverage					
	Availability and capacity of service providers					
Climate change	Negative impacts of future climate trends					
	Positive impacts by future climate trends					
	Likely investment costs in risk reduction relative to actors' annual income and capital stock					
	Investment horizon: horizon: by when are the climate impacts expected to be felt? By when should the risk reduction or adaptation investments be made? How long are the benefits expected to last?					
	Flexibility: is the option flexible (does it allow for switching to other options that might be preferable in the future once more is known about the changing climate)					
Further considerations						
TOTAL						

Source: modified by HELVETAS Swiss Intercooperation from the operational guide for the making markets work for the poor approach, 2014



Step 5: Identify possible adaptation to climate change and disaster risk management measures

Table 7: Identify adaptation to climate change and disaster risk management options

Climate risk rel functions (see Step 1)	evant market	Relevant climate risks (see Step 2)	Remarks on impacts	Adaptation to climate change and disaster risk management measures
Core	Transferred from Step 3, Table 5		-	•
Support				•
Rules/ Regulations				•

Source: modified by HELVETAS Swiss Intercooperation from the operational guide for the making markets work for the poor approach, 2014

Step 6: Prioritize and choose the best/most appropriate measures

Table 8: Prioritization of best/most appropriate adaptation to climate change and disaster risk management measures

	Effectiveness in enhancing resilience	Cost	Feasibility	Sustainability	Further criterion?	Overall evaluation (total)
Transferre d from Step 5, Table 7 → Possible adaptation and risk managem ent options	Explain how effective the option is enhancing resilience and score with (0) not effective, (1) effective, (2) very effective	Explain how costly the option is and score with high costs (0), medium costs (1), low costs (2)	Explain how feasible the option is to implement and score with not feasible (0), feasible (1), very feasible (2)	Explain how sustainable the option is and score with e.g. low (0), medium (1), high (2)	Explain and score the options to the criterion of your choice accordingly	Make an overall assessment of the option with regard to the outcome of the criteria scoring Cost/benefit considerations shall be taken into account

Source: modified CEDRIG, SDC



Step 7: Plan and implement selected measures

Table 9: Sustainability matrix (Action plan)

	Activities to implement adaptation	Immediate		Long	-term	Necessary interventions	
Functions	to climate change and disaster risk management measures	Who will do it?	Who will pay?	Who will do it?	Who will pay?	(including actors)	
Transferred from Step 5, Table 7 \rightarrow Possible adaptation	Transferred from Step 5, Table 7 → Possible adaptation and risk management options						
and risk management options							
options							

Source: modified by HELVETAS Swiss Intercooperation from the operational guide for the making markets work for the poor approach, 2014

Step 8: Monitor and measure results