



Conflict management in participatory integrated livelihood security project: A case study from North Western Indian Himalaya

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ARTICLE INFO

Article history:

Received : January, 2018

Revised : July, 2018

Accepted : August, 2018

Key words:

Conflict management,
RIC analysis,
Force-Field-Analysis,
Livelihood security,
Process based monitoring and evaluation,
Negotiation performance appraisal

ABSTRACT

Rainfed agriculture in North Western Indian Himalaya (NWIH) is highly diversified and presents high opportunities for development with number of challenges in achieving livelihood security through integrated project. These integrated projects are multi-stakeholder and highly dependent on simultaneous development of individually, collectively and government owned resources. Majority of the bottom-up planned projects also failed to achieve its boundary objectives in India owing primarily to socio-psychological constraints. Project implementing agencies (PIA's) are poor in handling these constraints *i.e.* conflict management skill. Study is based on process based monitoring and evaluation during project planning and implementation phase from NWIH. Study found that application of project management tools *viz.*, force-field-analysis (FFA) and relevance-importance-constraints (RIC) in project planning can help to identify probable degree of conflict in proposed activity, key players for it and their likely net impact on project activity in advance. Application of these techniques convert conflict from uncertainty to risk and help PIA to set new implementation priorities, and appropriate conflict management tools that can be applied, if required, to achieve the boundary objectives. Study suggests that project management tools and Human Resource Management in general with conflict management techniques invariably be included at undergraduate and higher-level education programmes of agricultural universities so that the future team of agricultural extension's and managers are well equipped to deal with conflicting situations in integrated agricultural and/or natural resource management projects to achieve boundary objectives effectively and make project outcome sustainable. Meta analysis of process based monitoring and evaluation studies will lead to better policy formulation that will have larger impact of future projects.

1. INTRODUCTION

Indian agriculture has dominance of marginal and small farmers. The agriculture, especially in rainfed areas, is susceptible to the climatic conditions as a result it is a low productivity venture with poor growth rate and profitability. In order to make rainfed agriculture sustainable. Serious attempts are being

made through various agriculture research/ extension efforts to make rainfed agriculture as a means of livelihood security in India.

This initiated from commodity, later shifted to sectoral and from 1990s integrated watershed development approach for sustainable development of all the natural and cultural resources leading to

livelihood security to people (Bhardwaj and Dhyani, 1994; Hanumantha Rao, 2000; GoI, 2010). Planning to implementation of these project also started from top down to bottom up approach which improved their impact. Primary stakeholders participation in planning and implementation of IWD (Dhyani and Samra, 2004). However, a large number of studies indicated that the achievements were lower than expected due to many reasons which are termed as constraints (Dhyani *et al.*, 2006 and 2009; GoI, 2010 and 2011; Hanumantha Rao, 2000; Kerr *et al.*, 2000; Kholia *et al.*, 2012, 2017a and 2017b). Majority (about 80%) of these constraints are related to the social aspects. A large number (about 70%) of these constraints due to difference in acquaintance level, perceptions and experience between/among primary/secondary/tertiary stakeholders. This situation is termed as conflict. This conflict arises during planning/implementation or after completion of a project. Therefore, management of conflict is prerequisite to achieve objective of a project and aims to enhance learning and outcomes inclusive to organizational effectiveness and/or performance through the process of conflict resolution (Rahim, 2002; Alper *et al.*, 2000; Bodtker and Jameson, 2001; Kuhn and Poole, 2000; DeChurch and Marks, 2001). Gregorio (2014) has presented a review on conflict at personal level and presented a new approach termed Party-Directed Mediation. PIA might have managed some of these conflicts during the planning through PRA and implementation of the project but they are not recorded. However, there is scarcity of literature on conflict management at un-organised small and marginal farmer's level integrated development project in general and in India particular. The paper presents conflicts faced their management experienced by adopting project management tolls to resolve these conflicts and its outcome from a micro level integrated agricultural development project aimed to livelihood security in NWIH.

2. MATERIALS AND METHODS

The project site is located between 32°27' to 32°27' N latitudes and 77°51'45"E to 77°54'E longitudes in foothills of NWIH. All 321 farm families of selected villages namely, Dungakheth, Pasauli, Devthala, and Godaria from Dehradun district of Uttarakhand were adopted.

Project Planning

Project was formally planned by adopting PRA

and orthodox scientific methodology for assessing field resource potential situation. Finalizing boundary objectives (livelihood security), participation (contribution of stakeholders) and accountability (institutional arrangement in place for sustainability of community based structure) were basic attributes of project planning. This project was initiated with good boundary work as explained by Cash *et al.*, 2003; Dhyani *et al.*, 2015; Clark, 2016; Kumar *et al.*, 2017). PIA applied project management tools namely:

(i) RIC techniques to anticipate likely conflict that may arise during implementation and (ii) FFA techniques to develop implementation strategies.

Relevance-Importance and Constraints (RIC) Analysis

RIC technique was applied to each intervention points to prioritise them further from implementation perspective. Each intervention was assigned a score out of maximum 10 independently on its relevance to primary stakeholders (through PRA) and work domain *i.e.* expertise of PIA. Average of the two by assigning equal weight to both groups of stakeholders was worked out and termed as score of relevance of the intervention. Importance of the intervention in relation to boundary objective by primary stakeholders and PIA was also scored by following same method. The likely level of constraints to be faced during implementation of an intervention was also scored by adopting method explained above and decided in joint sitting of PIA and group of PS and awarded score out of maximum *i.e.* 10. Maximum score of 10 was non-mutually exclusive to other criterion or intervention or group. Net score for each intervention was obtained by subtracting score in constraint column from the sum of score of relevance and importance criteria for a particular intervention. The interventions were ranked in the descending order of their net score. Higher net positive score of intervention indicate that the Intervention is more relevant, important and can be implemented with least resistant. Therefore they were taken on priority or vice-versa.

Force-Field-Analysis (FFA)

Project interventions are intended to bring a sustainable change in eco-system services for livelihood security through sustainable resource use pattern *i.e.* boundary objectives. The change is driven by forces exerted by the players (stakeholders) of the project. They may be primary / secondary / tertiary

stakeholders. The change perceived by a stakeholder(s) depends largely on his or their acquaintance status; perceptions, experience, attitude and perceived likely impact of the intended change in his (their) present status. Those who feel that the proposed intervention will improve their present position they may favour for change, while those who feels that intervention may affect them negatively they will oppose it. Thus a conflicting situation arises. The conflict may be among the PS, between PIA and PS and/or their VC's, non-participating contiguous villages or their VC, policy planner of the state, and funding agency (secondary stakeholders).

FFA was performed to prophesy of likelihood of occurrence of resistance to an intervention by the stakeholder(s). It helps in preparedness of PIA to develop appropriate strategy/alternatives to avoid or resolve the conflict amicably (preferably a win-win situation) so that planned intervention may be executed and boundary objective can be achieved. The PIA enlisted all the probable stakeholders for an activity in the proposed project. How strongly a stakeholder will oppose or support to an activity is termed as force and scored on three point scale *i.e.* strong (5), medium (3) and weak (1) scale independently. Similarly the impact of voice of a force (stakeholders) in decision making is another attribute that may affect the decision and termed as field of the force and measured on similar scale as applied in case of force. These scores are mutually exclusive.

The total score either in support or opposition of an intervention was assessed by summing up the product of multiplication of importance and intensity of each stakeholder in support or opposition of an intervention. If the total score in support of an intervention is sufficiently large than total score in its opposition, it was concluded that the intervention can be taken on priority as it will be accepted without much resistance by all stakeholders. The basic principle for high priority was by working together may resolve build confidence each other which helps in resolving many conflicts automatically. On the other hand, if total score in favour of intervention is sufficiently smaller than the score in its disfavour, then it was differed for later stage of project. If RIC analysis identified that low favourable score intervention is high priority intervention in achieving boundary objective, then appropriate strategy was

developed to change the score in favour of that intervention and intervention was differed till score was changed in its favour. In case the difference in total score between supporting and opposing forces is not high, it is likely that these interventions be implemented by medium level of management skill *i.e.* conflict resolution technique or it may automatically resolve by working together. Thus FFA helped in developing knowledge or strategies to promote positive driving forces and neutralize the arguments of opposing forces in implementation of the intervention(s) successfully. This helps in bringing sustainability in boundary objectives.

Conflict Management and Resolution

It is a process of bringing different opinion individuals or groups to a forum or platform to limit negative aspect of conflict while increasing to limit positive aspect of conflict. Basic objectives of the conflict management are enhance learning and group outcome, including effectiveness or performance in organizational setting (Rahim, 2002; Kuhn and Poole, 2000; DeChurch and Marks, 2001). Conflict resolution involve the reduction, elimination or termination of all forms or types of conflict. The Negotiation Performance Appraisal (NPA) is a tool for improving communication between or among conflicting parties (Alper *et al.*, 2000).

Negotiation is the core of conflict resolution where each side will get more by participation in negotiations than they would be walking away and it can be a way for the group to get resources that may be out of reach. Negotiation aims to produce a solution that all party can agree to find the relationship between/among the group of conflict. Interest, level of assertiveness and cooperatives and legitimacy are the core of negotiations on which adoption of conflict management model and possible outcome depends.

Blake and Mouton (1964) were pioneer to present a conceptual scheme for classifying the modes (styles) for managing inter personal conflict and grouped them in five types depending on the degrees (low or high) of assertiveness and co-operativeness as depicted below:

High Assertiveness	Competing	Collaborating
	Compromising	
Low	Avoiding	Accommodating
Low Cooperativeness High		

Competing: This style is also known as forcing where an individual or a group firmly pursues his or their conflict management styles-source Blake and Mouton concern despite resistance from either group/ individual solution of conflict. This approach is considered to be last resort a long-lasting conflict as it will lead to negative relations with opponent.

Collaborating: This approach tries to find a win-win situation of the conflict where both or all conflicting group satisfied with the outcome *i.e.* mutually agreed alternative, which meets concern of all party's concern. It builds a foundation for effective collaboration in the future. The methods require strong commitment from all involved parties and finding a solution (alternative) requires more time and technical competency of PIA.

Avoiding: This style is also known withdrawing. This method is applicable when one of the involved party does not pursue his/their own concern or those of opponents and the party simply withdraw. In this situation, one of the involved party see no chance of getting their concern met or have to put un-reasonable efforts or to deal with ostility.

Compromising: This method is applicable when goals of conflict management or issue of conflict are moderately important and did not require high degree of assertiveness. It is fastest method of managing a conflict. Arrived solution may lead to a loose-loose situation in long ran when all involved parties are not satisfied with the outcome and therefore require close monitoring and control to ensure the agreement are met in long run.

Accommodating: This method is applicable when the involved parties accommodate the concern of other party first of all, rather than one's concern. This is applicable in less important conflicts but had a risk to be abused *i.e.* opponent may constantly would like to take advantage of smoothing. Therefore, this method requires some more skill than others.

Research on conflict management styles were advanced in 1970 and 1980 and provide new nomenclature based on assertiveness and cooperativeness (Ruble and Thomas, 1976; Pruitt 1983). Khun and Poole (2000) classified them into distributive and integrative models. DeChurch and Marks (2001) suggest that all the available literature on conflict management styles and grouped them in either

activeness or agreeableness and termed as Meta taxonomy and concluded that activeness did not have significant effect on the effectiveness of conflict resolution. However, agreeableness style had positive impact on how groups felt about the way the conflict was managed. Rahim (2002) created another meta model for conflict styles based on two dimensions, namely concern for self and concern for others. He also propogated five approaches for conflict management namely: obliging, dominating, avoiding, integrating and compromising. All the models are basically based on two pillars *i.e.* assertiveness and cooperativeness of the parties involved as proposed by Blake and Mouton (1964). The models is simple to understand and ease to practice. Hence, the study selected Blake and Mouton approach of conflict management for the study.

All interventions were implemented with legitimacy and active participation of PS during 2007-08 to 2013-14 with a total cost of INR 85.70 lakh. Interventions were monitored and evaluated concurrently in participatory manner. Concurrent evaluation results were presented in open meeting (*kharif/rabi* crop season *Gohsthis*) after six months *i.e.* before start of that crop season in next year. Based on farmers' responses, mid-term corrections were made in planned intervention(s) and or implementation strategies if required. In some cases special group meetings of the interested parties were also called to resolve specific issue (conflict) as per convenience of PS and need of the project. Though project was initiated after good boundary work, yet the PIA has to face a good number of conflicts during implementation as perceived through FFA. Most of conflicts were from PS and resolved amicably by PIA. One conflict was from non adopted villages for which mediation was also sought from secondary stakeholders and one was from PRI of adopted villages and could not be resolved. For this, PIA adopted all the five methods (forcing, collaborating, compromising, withdrawing and smoothing) of conflict management techniques as presented in Table 1.

3. RESULTS AND DISCUSSION

The results and finding of process monitoring and evaluation at project planning and implementation is presented in three sections. Section I describes intervention new priorities based on RIC analysis, Section II explain FFA result and Section III presented

Table: 1**Activity, reason and conflict management technique(s) adopted**

Activity	Reason for conflict	Technique adopted
1. Input distribution under crop demonstration	Every farmer was interested to take maximum physical benefits	Collaborating
2. Participatory monitoring of crop demonstration	Casual attitude of some farmers (perception)	Forcing or competing and compromising
3. Plantation on degraded community land	Open grazing and fodder scarcity	Smoothing
4. Napier grass planting on field bunds	Misconception	Compromising
5. Vaccination and medication of domesticated animals	Misconception	Collaborating
6. Sericulture	Selected farmers' dubious nature	Withdrawing or avoiding
7. Community masonry pond	Insistent farmer	Forcing or avoiding
8. Rejuvenation of Earthen Water harvesting structure with LDPE lining for pisciculture	Antagonistic attitude of new VC for the activity	Withdrawing and avoiding
9. Commissioning and execution of GI pipe	Upstream-downstream conflict due to lack of confidence and high level of assertiveness by VC of downstream village	Smoothing, Compromising, Collaborating and Forcing through mediation
10. Water distribution sequencing	Poor technical knowledge	Forcing, accommodating & compromising
11. Location of risers (outlets)	Poor technical knowledge	Forcing within unit command area group
12. Laying of distribution PVC pipeline	Anticipating problem in future	Compromising within unit command area group

conflict management process adopted and their outcomes.

Section I : RIC analysis perform on various intervention points identified through problem-cause diagram during PRA exercise. The result are presented in Table 2. The interventions implementation priority changed through RIC analyses then the priority decided through PRA exercise (Dhyani *et al.*, 2015).

Section II: Results of FFA exercise performed for participatory water resources development, livestock based development of community land development activities are presented in Table 3, 4 and 5, respectively.

i) Participatory water resource development :- There are nine stakeholders for this interventions listed as forces. The doctom was observed in the PS behavior itself while other forces had one side decision. The degree of support and opposition depends on the extent to which stakeholders feel that it may affect their interest.

Total score in favour of intervention was 41 against 34 in its opposition out of 41 positive score, 10 were from PIA and its institute. Whose voice had little impact (field). In contrast to it, downstream VC, state policy planner and state government line department have higher field. Hence, it was concluded that strong opposition has to be faced in this. Therefore work was initiated in peace meal by negotiating the opposition party for each sub-activity of these interventions.

However, it was also realize by the PIA that the activity be made a success with the strong support of central government and funding agency. Without full support of these agencies this activity may not be completed. Thus funding agency and central government become key players in completion of this activity. It was decided that PIA will appraise the funding agency, water user association (WUA) will approach at central or state government level and both will jointly negotiate with the VC of downstream villages so that activity may be completed. PIA decided to monitor lean period flow in the stream during this period.

ii) Livestock based intervention:- Large population of less productive animal, fodder scarcity, open grazing and fallowing of arable land during *rabi* are the point for taking livestock development intervention. Their are only five forces which may support or oppose the interventions under this activity. It is further interesting that PS themselves support as well as oppose this interventions which is a state of low assertiveness and high cooperativeness. Detailed informal discussion with PS reveals that PS had a good number of misconception about improved livestock management.

The total score in favour of livestock based interventions was 43 against only three in dis-favour of it (Table 4). PIA developed a strategy to take this activity in collaboration with State Animal Husbandry

Table: 2
RIC analysis of PRA identified interventions

S.No.	Intervention	Relevance (10)	Importance (10)	Constraints (10)	Net score	Priority
A. On Farm Development on Private Land						
1.	Commissioning and execution of PVC pipe line	10	10	2	18	II
2.	Conservation Bench Terracing (CBT)	10	3	3	10	IX
3.	Grass sodding on bunds	10	10	1	19	I
4.	Dry land horticulture cum agro-horti system	5	6	3	8	XI
5.	Crop production and diversification of agriculture	10	10	1	19	I
6.	Improved composting	8	7	3	12	VII
7.	Rice fish culture	3	3	5	1	
8.	Pond pisciculture	5	5	4	6	
B. Off Farm Development (Community based)						
1.	Community pond (Masonry)	10	10	6	14	V
2.	Commissioning and execution of GI pipe	10	10	7	13	VI
3.	Rejuvenation of Earthen Water harvesting structure with LDPE lining for pisciculture (270 cum)	6	2	6	2	
4.	Afforestation and silvipastoral development	10	10	9	11	VIII
5.	Contour trenching	10	6	4	12	VII
6.	Dry land horticulture	8	7	4	11	VIII
7.	Drainage line treatment (Gabion structure gully plugs and vegetative barriers)	8	4	3	9	X
8.	Plantation of biofuel and other vegetative species in degraded lands	8	3	5	6	
9.	Income generating activities through SHG's for landless and marginal farmers					
a.	Mushroom cultivation units	5	3	4	4	
b.	Sericulture units	2	1	3	0	
c.	Bee keeping	2	1	1	2	
C. Livestock Development						
1.	Ecto parasite control (4 time/year)	7	8	3	12	VII
2.	Endo parasite control (twice a year)	7	9	5	11	VIII
3.	FMD, HS&BQ (once a year)	7	10	5	12	VII
4.	Urea treatment of Straw/Dry fodder	7	4	6	5	
D. Training and Extension						
1.	Exposure visits	10	8	2	16	III
2.	Farmers training	10	8	4	14	V
3.	Kisan Gosties	10	10	5	15	IV
4.	Kisan Mela	10	2	-	12	VII

Department presently working in the area and adoption of appropriate extension methods in different villages to remove the misconceptions of farmers. Thus, state Animal Husbandry Department and PS were identified as key players to make it successful. Special meetings of PS locally called Animal fair (*Pashu Mela*) were organised twice a year (June- before rainy season and November-December-before winter season) in presence of livestock experts from state government (district and local unit). Positive outcome of demonstrated crop interventions also helped in bringing score in favour to livestock interventions indirectly.

iii) Community land development: Community land was being utilize as open grazing land by all the farmers of adopted as well as non adopted villages

almost during the whole year. Consequently, PS of adopted villages and non adopted villages and theirs VC's are main force in development of the community land.

The FFA analysis showed that total score in favour of this intervention (11) is far below than total score (24) against it. The intervention is strongly opposed by PS and at medium level by farmers of surrounding villages. This resistance was realized during PRA also but PS also desired to develop it as it is vital for sustainability. Resistance is attributed to historical practice *i.e.* open grazing followed in rainfed cultivable area and community land by all the villagers after harvest of rainy season crop. PRA revealed that there is scarcity of green fodder and farmers are compelled to fallow open grazing as well

Table: 3
Force-Field-Analysis for participatory water resource development

Supporting forces, their intensity and importance			Forces	Opposing forces, their intensity & importance		
Weak (1)	Medium (3)	Strong (5)	Individual/Group/Organization/Units involved	Strong (5)	Medium (3)	Weak (1)
-	3 (3)	-	PS	-	-	1 (1) Belongs to weaker section of the society
-	-	-	VC of the downstream villages	5 (3) Shortage of water availability	-	-
-	3 (3)	-	VC of beneficiary village council	-	-	-
-	-	5 (1)	PIA	-	-	-
-	-	5 (1)	Institute head of PIA	-	-	-
-	-	-	State government department	-	-	1(3) Activity may adversely affect water supply line
1 (5)	-	-	State government policy planner	-	3 (5) Downstream VC belongs to ruling party	-
-	3 (1)	-	Funding agency	-	-	-
1 (5)	-	-	Central government policy planner	-	-	-
[41] 10	21	10		15	15	[34] 4

PS: Figure in parenthesis indicates influence area of force i.e. field, Source - Dhyani et al., 2015

Table: 4
Force-Field-Analysis for livestock based interventions

Importance and strengths of opposing forces			Forces	Importance and strengths of opposing forces		
Weak (1)	Medium (3)	Strong (5)	Individual/Group/Organization/Units involved	Strong (5)	Medium (3)	Weak (1)
-	3 (3)	-	PS	-	-	1 (1) Misconceptions
-	-	5 (1)	PIA	-	-	-
-	-	5 (1)	Head of PIA	-	-	-
-	3(5)	-	Chief veterinary officer	-	-	-
-	-	5 (3)	Local unit of para vet services	-	-	-
[43]	18	25		-	-	[3]

PS: Figure in parenthesis indicates the strength of the force, Source - Dhyani et al., 2015

Table: 5
Force-Field-Analysis for development of community lands

Importance and strengths of supporting forces			Forces	Importance and strengths of opposing forces		
Weak (1)	Medium (3)	Strong (5)	Individual/Group/Organization/Units involved	Strong (5)	Medium (3)	Weak (1)
1 (1)	-	-	Primary stakeholders of adopted villages	5 (3) Open grazing will stop	-	-
1 (5)	-	-	Project team	-	-	-
-	-	-	Primary stakeholder of other villages	-	3 (3) Activity will stop grazing land	-
5 (1)	-	-	Village council of adopted and non adopted villages	-	-	-
[11] 11	-	-		15	9	[24]

PS: Figure in parenthesis indicates the strength of the force, Source - Dhyani et al., 2015

as excessive lopping of trees from surrounding reserve forest. PIA realised that to curb this, special efforts are required to bridge fodder demand and supply gap by enhancing green fodder availability from arable land and private wastelands by planting hybrid Napier.

Section III : Conflicts and their resolution:- The project was planned after good boundary work after triangulation with PS and their VC's. During implementation of interventions, 12 conflicts were faced by PIA. Out of them ten were resolved amicably and only two could not be resolved (Table 6). These conflicts were divided in four groups; namely i) PS and PIA, ii) among user group members, iii) among PS, PIA and VC of downstream village and iv) VC and PIA.

Table: 6
Status of Conflicts resolution

S.No.	Activity	Outcome
1	Input distribution under crop demonstration	Resolved (win-win)
2	Participatory monitoring of crop demonstration	Resolved (win-win)
3	Plantation on degraded community land	Resolved (win-win)
4	Napier grass planting on field bunds	Resolved (win-win)
5	Vaccination and medication of domesticated animals	Resolved (win-win)
6	Sericulture	Not resolved (loss-loss)
7	Community masonry pond	Resolved (win-loss)
8	Rejuvenation of earthen water harvesting structure with LDPE lining for pisciculture	Not resolved (loss-loss)
9	Commissioning and execution of GI pipe	Resolved (win-win)
10	Water distribution sequencing	Resolved (win-win)
11	Location of risers (outlets)	Resolved (win-win)
12	Laying of distribution PVC pipeline	Resolved (win-win)

Brief description on conflict resolution processes adopted for different conflicts are explained below:

i) Conflict between PS and PIA

Agricultural input distribution: Every farmer was interested to take maximum physical benefits from the project in the form of inputs of maximum number of interventions. Adoption of this method would have skewed the distribution of project budget in favour of big farmers and have resulted more economic inequality and violation of legitimacy principle of boundary work. Hence, input distribution modalities

were developed in a joint meeting of PS, VC and PIA. In this meeting, PS as well as PIA both tried to solve others concern amicably. It was decided that inputs for one acre land would be given to each farm family of adopted villages, who had two or more acre land holding for four major crops, namely; Maize, Paddy in *kharif*, *toria* and Wheat in *rabi* otherwise input will be provided for one above intervention in each crop season based on preference of the farmer. Marginal farmers who were interested in vegetable crop production, they were given input for more than one intervention subject to maximum for 0.1 acre. All decisions on interventions or input distribution were taken in an open meeting. Six monthly action plans were finalized during *Kisan Gosthies*. Dates and venue of *Kisan Gosthies*, and place of input distributions were announced among targeted groups three to four days before the event(s). All inputs were distributed at a common place on pre fixed dates in each village (as per demand of the farmers) in presence of PIA. An input distribution registered was maintained which was signed by all input recipient in public. Thus win-win situation was created.

Apathy of farmers in monitoring and evaluation of project activities: Participatory monitoring and evaluation for output-outcome was one of the important activity for mid-term corrections, impact assessment and learning to PIA and PS. In first year, many farmers participated in this activities in casual manner based on their perception on other developmental programme of the government where monitoring is limited to physical and financial achievements *i.e.* input distribution and output/outcome monitoring largely missed. PS took this process also a kin of that and did not maintained data properly. The PIA purposed some restriction on casual performer for both crop seasons in the form of no supply of inputs in future. Initially, there was resistance for such regulation by all PS. The PS requested to reduce the restriction for one crop season only and may be extended this season to casual performers to next whole year. PIA agreed to this and realizing the need and boundary objective of the activity. PS participation improved subsequently. Thus win-win situation was created.

Plantation on degraded community land: Open grazing in current arable fallow land during *rabi* season was an age old practice in the area since dates back. PRI's of adopted villages were requested to

advise farmers to stop open grazing but it could not be stopped. It was primarily due to large number of less productive animals and acute shortage of fodder. Consequently, stunted growth of new plantation and complete failure of grass plantation was observed during concurrent evaluation. The PIA changed strategy and hybrid Napier plantation on arable land risers was taken vigorously. With the advent of improved fodder availability, farmers started replacing large number of less productive animals by crossbred cow and/or improved buffalo breeds and adopted stall feeding. As a result, open grazing was reduced and good vegetation has come up in the common land. It is expected that the activity will yield similar results on reserve forest land as observed in Fakot watershed (GoI, 2011) in long run.

Plantation of hybrid napier on field bund: PS adopted villagers had a general perception that Napier is not a quality fodder and have negative impact on crop yield owing to competition for nutrients and moisture with field crops. Farmers were also had a perception that suckers of Napier are sweet that attract rodents which damages the main crops. The negative perception changed after two years of continuous demonstrations on smaller scale on field bunds which increased green fodder availability during summer. Of late, farmers could know the easier way of trapping and eliminating rodents using water flushes when rodents are assembled near root zone of Napier grass. Consequently, farmers came forward for large scale plantations on field bunds and degraded waste lands. Thus win-win situation was created. Technology was up-scaled in project area and other villages on large scaled. Consequently biotic pressure on forest was reduced by more than 80%.

Vaccination and medication of animals: Animals were managed by the villagers using traditional methods and do not adopt improved animal healthcare due to numerous misconceptions (Fig. 1). To remove these PIA adopted three different approaches namely: mass contact, group contact and personal contact method in different villagers to clear misconceptions. It was observed that personal contact method is most effective. However, blending of all three methods was suggested for wider adoption of modern technologies in short time that increases the efficiency of interventions (Muruganandam *et al.*, 2013). Inputs for animal health related interventions

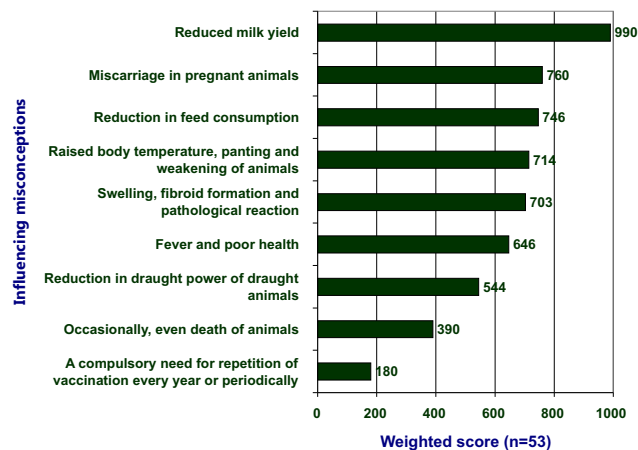


Fig. 1. Misconceptions of farmers disagreed for vaccination and medication

were distributed legitimately to all participating farmers in animal healthcare camps organized twice a year in one of the adopted villages on rotational basis with collaboration of state Animal Husbandry Department.

ii) Conflict among users groups

Community masonry pond: Thomas *et al.* (2003) stated that Human institutions-ways of organizing activities-affect the resilience of the environment. Locally evolved institutional arrangements governed by stable communities and buffered from outside forces have sustained resources successfully for centuries. Ideal conditions for governance are increasingly rare. A WUA consisting of farmers from Pasauli and Devthala villagers was formed to harvest surplus water from *Serukhala* for irrigation (Kumar *et al.*, 2017). PIA and WUA identified a location to construct water storage tank, which was owned by one of the WUA member. WUA and farmers agreed to waive required contribution and irrigation charge for ever in lieu of land. On completion of pit digging, WUA requested land owner farmer for signing MoU on greed condition. The land owner put two new demands; i) system will be operated by his family without interference of WUA; and ii) no family of the WUA will use the tank site for any purpose. WUA did not agreed the new demands. WUA and land owner farmer held several joint meetings for negotiations where PIA worked as a mediator. The negotiation could not reach as both were not ready to compromise further. This is a situation of high assertiveness and low co-operativeness. The WUA and PIA selected another site for construction of tank. The

new site was owned by Langha village council. The Langha VC leased out the land to WUA for the purpose of water collection tank without any charges and tank was constructed.

Laying of distribution PVC pipeline: At project planning stage all members of WUA agreed for laying of common PVC pipeline for distribution of water to farmers having land to both sides /flank of the line. But at the time of actual laying PVC pipe line, farmers demanded separate distribution PVC pipeline for each flank. Realizing the distance of farmer's field and gradient from pre-proposed pipe line, PIA realized that the farmers having land at farthest to the right flank have to pay more money for same amount of water due to distance, gradient and violates the legitimacy principles. PIA compromised and provided separate underground pipelines to the farmers of both flanks. Project budget saved caving of WUA member's labour contribution was utilized to purchase additional PVC pipes. The group demanded that pipeline be laid in such a way that it should be equidistance to most of the farmers or the quantity of water lost in conveyance system (seepage and conveyance time) may not be charged from the stakeholder. This option was found unfeasible and alternate arrangement was suggested. Historical defunct water channel was proposed by PIA for laying the PVC pipeline for which farmer group agreed. Thus it was compromising as well as forcing. The PIA estimated that pipe line has a discharge @ 10 lit sec⁻¹ and based on that a command area of 2.5 ha was found to be suitable for each riser. Further, each riser was considered as a unit and farmers likely to take water from a riser were suggested to form a group called unit command user group (UCUG). Each group was asked to purchase collapsible PVC pipe with a maximum length that can reach to the farthest field. Thus forcing and compromising techniques were utilized to find a win-win solution for which farmer agreed.

Location of riser: Every farmers of a unit group desired that riser may be installed closer to his field to minimize irrigation time. To avoid this PIA convinced the group that initial point of each unit will be appropriate point so that gravitational force may be utilized maximum possible to reduce conveyance time. Though it was forcing but all unit groups accepted and conflict was resolved with win-win situation.

Water distribution sequence: The proposed command

area was gravelly and less suitable for irrigated paddy crop. Therefore irrigation water was required primarily from the month of September to mid of June. After series of informal group discussion, the WUA and PIA agreed that first come-first serve (FCFS) will be followed in each UCUG and water distribution to each unit will be first unit to last unit in one year and next year it will be reverse *i.e.* from last unit to first unit. Thus compromising and forcing techniques worked and farmers are following it and may be termed a win-win situation.

iii) Conflict among PS, PIA and VC of down-stream villagers

Upstream-downstream conflict: Water for irrigation was second most priority of PS (through PRA) and ranked VIth (through RIC analysis) from implementation perspective realizing the likelihood of more opposition by the secondary stakeholders. GI pipeline laying from *Serukhala* stream to the village Pasauli was one of the major activity. The activity was approved by the VC's of all the three participating VC before implementation of the programme. Before taking activity, WUA of party farmers from Pasuli and Devthala was formed for ensuring participation and accountability. Based on RIC analysis, PIA decided to measure lean period flow in the stream for two years to ensure uninterrupted drinking water supply to down-stream villages during lean period (March to June) and discussed the survey output to all partner VC's and WUA. Hydrological survey reveals that the activity is technically feasible. Sufficient water will be available to run a water mill and drinking water to the villages down below during lean period. Therefore actual work on irrigation system was initiated after two years. Election for Community Development Block level PRI were held during 3rd year of the project. Newly elected VC of Rudrapur initiated objection to this activity through their state legislature (policy planner). Based on his recommendation the state government ordered to differ the work till report is submitted by the state government expert team. The WUA of Pasuli village sought the help of the Chairperson of the *Zila Parishad* (PRI at district level). The Chairperson recommended for continuation of the scheme. The State government deputed two different expert teams at two different points of time to assess the likely impact of the activity on drinking water supply to down-stream villages. PIA and WUA

conducted the visits of the State team and explained the likely outcome of proposed water conveyance system on Pasauli and Devthala village and on water supply system to Rudrapur village so that proper mediation may be done by the State Government.

During field visit of second expert team, heated discussion was held between WUA and members of Rudrapur VC. After mediation by PIA, WUA offered written undertaking to Rudrapur VC and drinking water supply authority that WUA will not use water from proposed pipeline for irrigation purpose if drinking water scarcity is observed by Rudrapur villagers with lock and key system. To ensure this agreement, WUA was ready to accept the possible arrangement in presence of PIA and state team. The behaviour of Rudrapur VC was forcing and was not ready to accept any thing less than withdrawing of this intervention. The expert team suggested to extend this irrigation pipeline about 1.75 km further and connect it to drinking water collection tank for Rudrapur village *i.e.* they were trying to full fill their departmental objective with high priority rather than working as a true mediator. PIA could not agree to the recommendation due to Paucity of funds and ended with no result. PIA continued their efforts to resolve the issue by organizing meetings with Rudrapur VC to understand their views so that Rudrapur VC and WUA may be brought to negotiation table. WUA was not ready to meet Rudrapur VC in their village based on their past experiences. The matter could not be resolved even after good number of meetings with Rudrapur VC for more than two years by PIA. Consequently cracks were developed in the RCC tank constructed earlier for water collection. Subsequently, the WUA also changed its office bearers. New executive body of WUA requested Central Government policy planner to intervene for withdraw of ban imposed. The minister wrote a letter to the State Government and based on his letter, the State Government ordered for completion of work and work was completed. Challenging this, Rudrapur VC filed a public interest litigation (PIL) against the scheme in the Hon'ble State High Court of Uttarakhand. The Hon'ble Court also ordered decision that the project should ensure un-interrupted drinking water supply to the Rudrapur village. No water scarcity or dispute on this issue was observed after completion of the activity till date. It indicates that apprehension of Rudrapur VC was either due to

lack of knowledge or accommodating syndrome. On completion of the water resource development activity, likely beneficiary from the system of Devthala village who withdrew from WUA during conflict, again approached to the PIA to re-admit them in WUA as per initial plan. Joint meetings of WUA and interested farmer from Devthala were organized by PIA as mediator. WUA finally accepted them as member of WUA with certain conditions of payment of their contribution. This indicates that understanding of current state of pro-conservation motivation and attitudes and pro-social and pro-environmental behaviour are important context variables as also suggested by Juliana *et al.*, 2017; Jack, 2009; Muradian *et al.*, 2010; Vatn, 2010.

iv) Village council and PS

Rejuvenation of earthen water harvesting structure with LDPE lining for pisciculture: There was a refuge pond under control of Rudrapur VC. The pond was located on one side of the main road that connects many villages. pisciculture in this pond have high demonstration value besides economic contribution to the PRI and the farmer(PS). Pisciculture in village Rudrapur community pond was one of the proposed interventions and agreed by their VC at the time of project planning. Pisciculture was found economically viable in first year of the project. A farmer came forward to take it on lease from the Rudrapur VC for fish culture after rejuvenation. at the time of project planning agreed to village refuge water tank to one of the farmer from their village. New VC of Rudrapur opposed water source development and leasing of village community pond for pisciculture to one of the family belonging to the weaker section of the society of their VC. PIA put forth all the possible alternatives, but Rudrapur VC did not agreed and the activity could not be performed owing to non-cooperative and authoritative attitude of Rudrapur new VC. This brought many other negative effects in the minds of adopted villagers. One of the negative impacts is that the probable beneficiaries of water resource development activities from Devthala village discontinued their contribution to the proposed water resource development. Indifferent attitude of newly elected VC of Langha is also contributed to slow progress of the water resource development. Cumming (2017) reported that although each failure may appear unique, research has identified a number

of recurring system dynamics that can create unwanted surprises and/or problems in efforts to solve problems of resource use and management. Recognizing these dynamics in conservation can help people to understand their own difficulties and learn from the experiences of others when resolving them. Therefore it is suggested that such experiences may be monitor and documented so that effective policy may be form after meta analysis of such studies.

4. CONCLUSIONS

Agriculture by small and marginal farmer in India is not basically for commercial purpose. Hence, normal business model is less applicable to improve productivity and profitability of these groups. The conclusions drawn from the studies are listed below:

1. Agriculture development in rain dependent agriculture can be brought through simultaneous development of community own natural resources for e.g. water, community land, reserve forest and water coarses etc.
2. Agricultural development projects in India, represents a typical case of managing multi-resources by multi-stakeholders with varied priorities, perception and influence. Therefore management of such project required not merely a technical expertise but also social expertise too.
3. Technical sound project planned by conversing PRA and aurtherodox technical method did not ensure achievements of boundary objectives.
4. Applications of project management tools for e.g. RIC and FFA may help project management in developing the appropriate implementation priorities and prophasey the likely conflict and forces to it.
5. Application of conflict management techniques facilitates in conflict resolution and achievements of boundary objectives.
6. None of the conflict management style is perfect. The application of conflict management techniques depend on the nature of problem, assertiveness and co-operativeness of conflicting party. It may be possible, in many instances, that a combination of more than one technique may be required to manage the conflicts.
7. Present technical education system in India does not equip the student on conflict management in general and agricultural/rural development projects in particular. Lang, 2009 also observed this gap in business education also in other parts of the world. Consequently, this graduates find themselves incompetent to deal with conflicting situations. Therefore human resource management with project management tools and conflicting management techniques may be included in curricula of university under graduate and high level programmes specially in developing countries.
8. Majority of the evaluation studies focused on impact (final product) aspects of the projects but forget the process monitoring and evaluation by which it has been achieved or not.
9. Process evaluation results are generic in nature and have wider applicability hence, process monitoring evaluation should be integral part of the project and meta analyses of these result may be utilize for policy formulation.

ACKNOWLEDGEMENTS

Authors are indebted to the ICAR for permitting to take up this project from MoRD, Govt. of India. Motivation and guidance received from the then and present Director of the institute is heartily acknowledged. Team is thankfully acknowledged financial support provided by MoRD, appreciate administrative and moral support provided by the TDET team of DoLR, GoI. Services rendered by contractual staff of the project are duly acknowledged. Varied experiences with the farmers of adopted and nearby villages with their village council members are worth learning experience and team acknowledge them for their valuable contribution.

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